

# FARM CHEMICALS

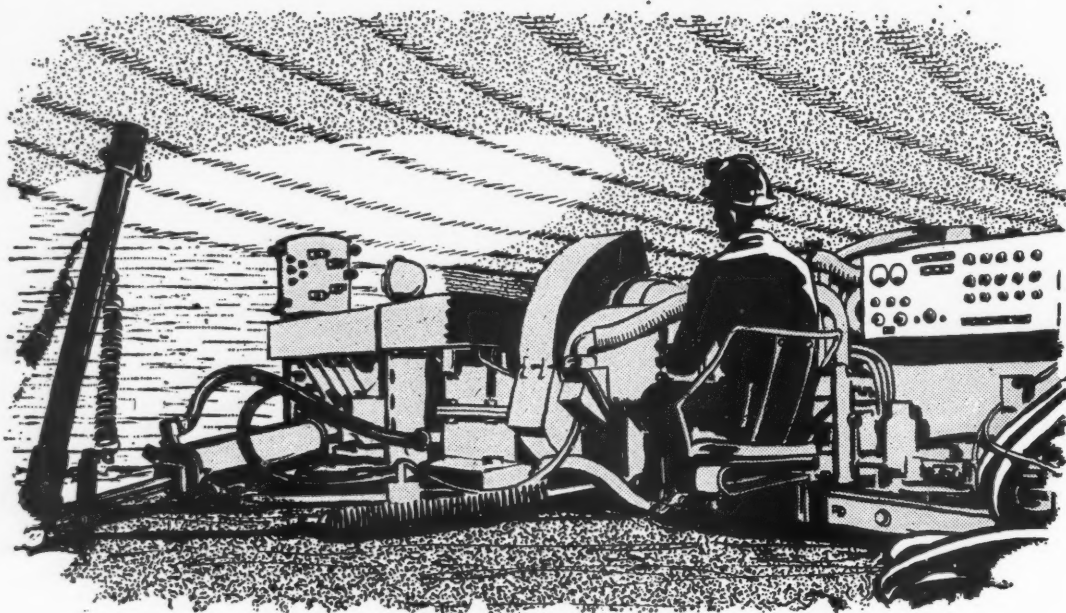
December Volume 123 No. 12 50 cents  
Pioneer Journal of the Industry



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NFSA to sell  
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**R. N. Stewart**, Manager, Ark-Mo Plant Food Company, Walnut Ridge, Arkansas. Mr. Stewart has been with Ark-Mo 12 years.



Setting the pace in Arkansas, the Ark-Mo Plant Food Company became the first fertilizer manufacturer in that state to install granulating equipment. Working with Spencer Tech Service specialists, they developed a new granulating process. Read about the help you, too, can get from Spencer:

## Spencer Helps Ark-Mo Plant Food Company Pioneer Arkansas' First Granulation Plant

Walnut Ridge, Arkansas, is the home of that state's first fertilizer granulating plant—thanks to the progressive spirit of the Ark-Mo Plant Food Company and the know-how of Spencer's Tech Service team. Together, they pioneered the development of a new granulating process.

**Experienced Spencer specialists** worked with Ark-Mo from the early experimental stages to help design and engineer the new facilities. A long-time SPENSOL user, Ark-Mo produces 50,000 tons of fertilizer a year.

**Helping mixers overcome** production problems is a challenge that Spencer Tech Service men often face. They have vast experience—both in the

field, and through Spencer's own pilot fertilizer mixing plant. Maintained especially for research, this pilot plant is the scene of continuing experimental work.

**So, whether your problem is** building a new facility, or improving the efficiency of an old operation, Spencer's Tech Service men stand ready to help you find the best solutions. As a prime supplier of nitrogen to the industry, Spencer makes reports of pilot plant experiments available to all manufacturers. You need not be a SPENSOL GREEN\* user—just mail your request to Spencer at the address below. For assistance on a specific problem, contact your Spencer representative. No obligation.

\*SPENSOL GREEN is a trademark of Spencer Chemical Company.

### Why SPENSOL GREEN Cuts Your Corrosion Costs In Half:

Below are results of laboratory tests comparing SPENSOL GREEN with competitive ammoniating solutions. Note that SPENSOL GREEN is less than *half* as corrosive as the nearest competitor. That's why you can save repair costs, parts and down time by doubling the life of your equipment with non-corrosive SPENSOL GREEN!

Number	Corrosion (In. Per Year)	Variation From	
		SPENSOL GREEN	
Brand A	.021	91%	
Brand B	.024	118%	
Brand C	.300	2,630%	
Brand D	.022	100%	
Brand E	.234	2,030%	
Brand F	.017	54.5%	
Old SPENSOL	.017	54.5%	
SPENSOL GREEN	.011	*****	

*Insist on*

# SPENSOL GREEN

NON-CORROSIVE AMMONIATING SOLUTIONS



**Spencer Chemical Company**  
Dwight Bldg., Kansas City, Missouri

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#### MEMBER BUSINESS PUBLICATIONS AUDIT

The national business magazine for the fertilizer and pesticide industries, **FARM CHEMICALS**, serves primarily those persons responsible for management, marketing and production. It has a qualified circulation for selected executive and supervisory persons within specified segments of these industries, as well as in certain closely allied fields. Subscription rates to all others are: in the U.S., its possessions, Canada, Cuba and Panama: \$6.00; in other countries: \$7.50. Current issue 50 cents. Back issues \$1.00. (Current issues become back copies on the 5th of the month following publication.) Established in 1894 as *The American Fertilizer*.

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# FARM CHEMICALS

Vol. 123 No. 12 December 1960

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## THE COVER PICTURE

The National Fertilizer Solutions Association offered a program that allowed its members to be exposed to the ideas of many agricultural experts. Walt Colvin, director of agricultural sales for Allied Chemical's Nitrogen Division, discussed his company's sales program for 1961, with Bob Garst of Coon Rapids, Iowa and Howard Lathrope, (right) field agronomist for Nitrogen Division. **FARM CHEMICALS** photo courtesy of Allied Chemical Corporation, Vincent Juliano, Staff Photographer.

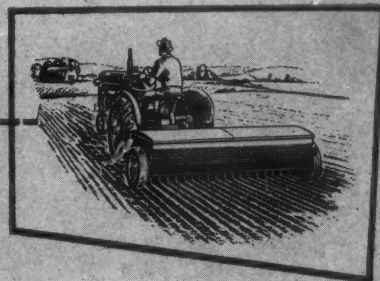
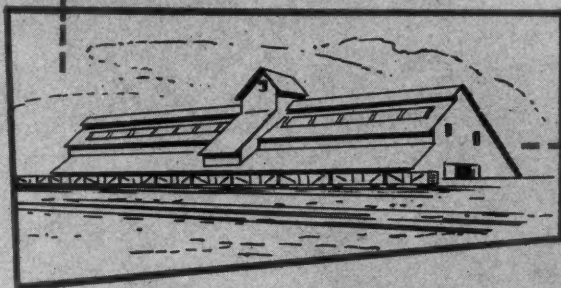


# FERTILIZER CHEMICALS

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You cut cost with combined carload lots From One Basic Source—Save time, plant space and labor by using our Custom Formulated Mixtures — Combination of Minerals Mixed To Your Particular Specifications.

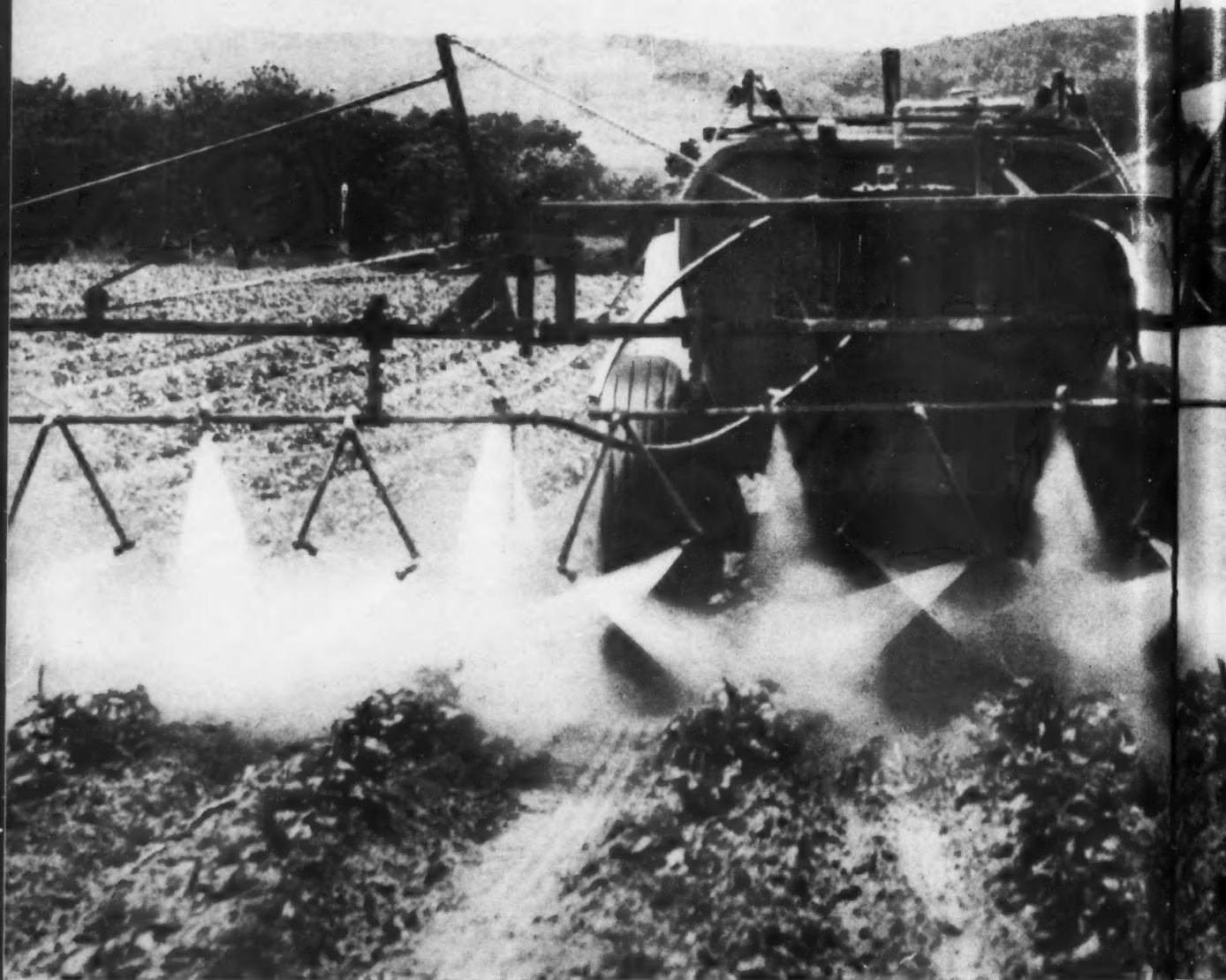
Call or write us for further information on Tennessee's Fertilizer Chemicals.



**TENNESSEE CORPORATION**

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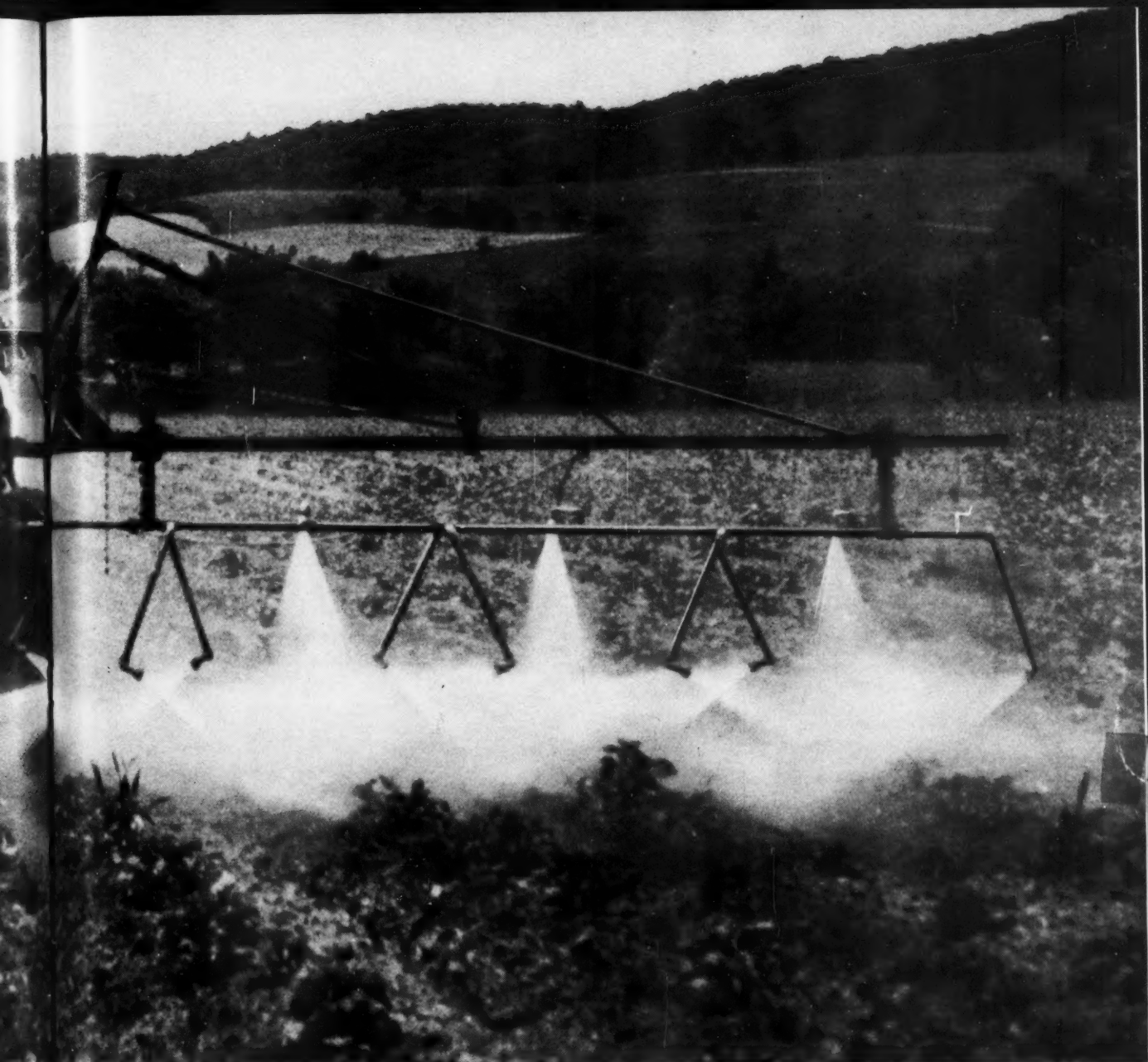
Only Stainless Steel lets you profit from all the advantages of liquid farm chemicals. You don't have to worry about corrosion or scale forming in Stainless Steel equipment. With no clogged nozzles, booms or screens, there's less down time for repairs. Your Stainless Steel tank needs little maintenance. Just a proper rinse between jobs and you can switch solu-

tions without any danger of contamination.

It's true the initial cost of Stainless Steel is more. But, it outlasts any other metal—30 years' service life. Stainless is not unusual. The cost-per-year of Stainless Steel is low. Comparing maintenance and replacement costs with other types of chemical tanks, Stainless tanks are less expensive to own and operate than any

Watch United States Steel's special Christmas show, *The Coming of Christ*, in Color on NBC-TV, Wednesday, December 21, 8:30 P.M., E.S.T.





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other material.  
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 United States Steel Supply—Steel Service Centers  
 United States Steel Export Company  
**United States Steel**



# LETTERS

**F  
C**

## FC's SALES SERIES

Larkfield, Kent (Great Britain)  
I was interested to read the article "Don't Play With Price" by O. C. Merrett and would be very grateful if you could let me have copies of the previous five articles in FARM CHEMICALS' Salesense Series.

Yours faithfully,  
R. T. CREASEY  
REED MEDWAY SACKS LTD.

Minneapolis 16, Minn.

We are interested in receiving reprints of an article that appeared in your August 1960 FARM CHEMICALS issue, entitled "Organize Your Time." . . .

Very truly yours,  
(Mrs.) CLARA F. CARLSON  
UNITED PETROLEUM GAS CO.

Cambridge, Md.

Please send me six copies of the Successful Selling Series by Ted Pollock. Bill them to us, please.

Sincerely,  
JOHN S. NEILD, JR.  
Sales Manager  
DORCHESTER FERTILIZER CO.

Middleport, N. Y.

Please forward two copies of your Successful Selling Series. Attached is my check for \$6.50. Please send paid invoice.

Thank you,  
DALE A. KIRKPATRICK  
Niagara Chemical Div.  
FOOD MACHINERY AND  
CHEMICAL CORP.

Milano, Italy

We would appreciate receiving a copy of your publication, the 1959-1960 Successful Selling Series. Will you please have this mailed to the following address? Societa Edison, Biblioteca, Foro Bonaparte, 31, Milano, Italy . . .

Thanking you for your kind attention to our request, we are,

Yours faithfully,  
SOCIETA EDISON

## SIMPLOT STORY

Chicago 51, Illinois

I was most happy to read the Simplot two-way radio story in the November issue.

Your magazine is to be complimented on the fine job it did in presenting this material. I thought the layout was excellent.

Kindest thanks for your acceptance and use of this story.

Best regards,  
BILL MAHONEY  
Press Relations,  
Communications Div.  
MOTOROLA COMMUNICATIONS  
AND ELECTRONICS, INC.

P.S. Would it be all right for Motorola to make up a reprint of the article? A FARM CHEMICALS credit line would, of course, be included on the reprint.

*We would be happy to have you use our article.*

Cincinnati 13, Ohio

We want to thank you for your cooperation in printing some of the new product and new literature publicity releases that we have sent you.

The inquiries we receive are of great value to us. They let potential customers know about OPW-Jordan products. In addition, they serve to stimulate our field sales force.

Our sales volume has been steadily increasing, due, in part, to the cooperation we have received. You may be sure that this plays an important part in our space advertising plans. As we grow, we will expand our advertising budget considerably.

Once again, thank you for your cooperation. Let us know whenever we can be of assistance to you.

Sincerely,  
D. H. CULVER  
Advertising Manager  
OPW-JORDAN CORP.

## DEALER MEETINGS

Los Angeles 15, Calif.

We would very much appreciate if you would send us a complete set of FC Reprints "Dealer Meetings that Pay." Kindly send us a bill to cover cost of same.

Very truly yours,  
LAWRENCE R. SMITH  
Manager, Advertising and  
Public Relations Dept.  
COLLIER CARBON AND  
CHEMICAL CORP.

Hermansville, Michigan

I noticed an article in your magazine some time back which was written by an authority on the problems regarding linings for liquid fertilizer tanks, etc. I believe it was in your July issue . . .

Would it be possible for you to send me a copy of this—or the magazine? We would like to contact the author of this article.

Yours very truly,  
R. M. MINOC  
BROTHERS, INC.

Portland 4, Oregon

We publish a Newsletter for our client, Stauffer Chemical Co., which is distributed throughout seven western states and western Canada. We have learned from an eastern source that your October issue contained two articles, one on pelletized BHC and one on Thuricide, that would be of interest to our readers.

We shall appreciate it very much if you could furnish us tear sheets of these articles and permit us to excerpt portions of them for our Newsletter. We shall be glad to give credit for the articles if desired.

Sincerely yours,  
HUGH A. SCOTT  
GRANT THUEMMELE AGENCY

Midland, Mich.

Please send me a copy of your article listed in the May 1960 *Distribution Data*

Guide entitled, "Marketing Research and its Importance to Farm Chemicals Manufacturers." . . .

Very truly yours,  
(Miss) E. M. FLORANCE  
Market Research Dept.  
DOW CHEMICAL CO.

## RUCKER NAMED DIRECTOR OF INFORMATION

Delbert L. Rucker has been appointed as director of information for The Sulphur Institute. He will be responsible for all public and industrial information programs of the new international research organization.

Rucker has been serving as director of publications and visual services for the National Plant Food Institute.

## FARM FERTILIZERS PROGRAM FOR DEALERS

Farm Fertilizers, Inc. is pioneering in the establishment of the most intensive merchandising program ever offered to fertilizer dealers. It is an on-the-job training program.

Meeting for their first two-day session, some 20 dealers were welcomed by Richard E. Bennett, president of Farm Fertilizers. Bennett told the group, "... farmers demand that you earn their business by performing services that will satisfy their needs. We must adjust our selling procedures to fit the farmers' needs."

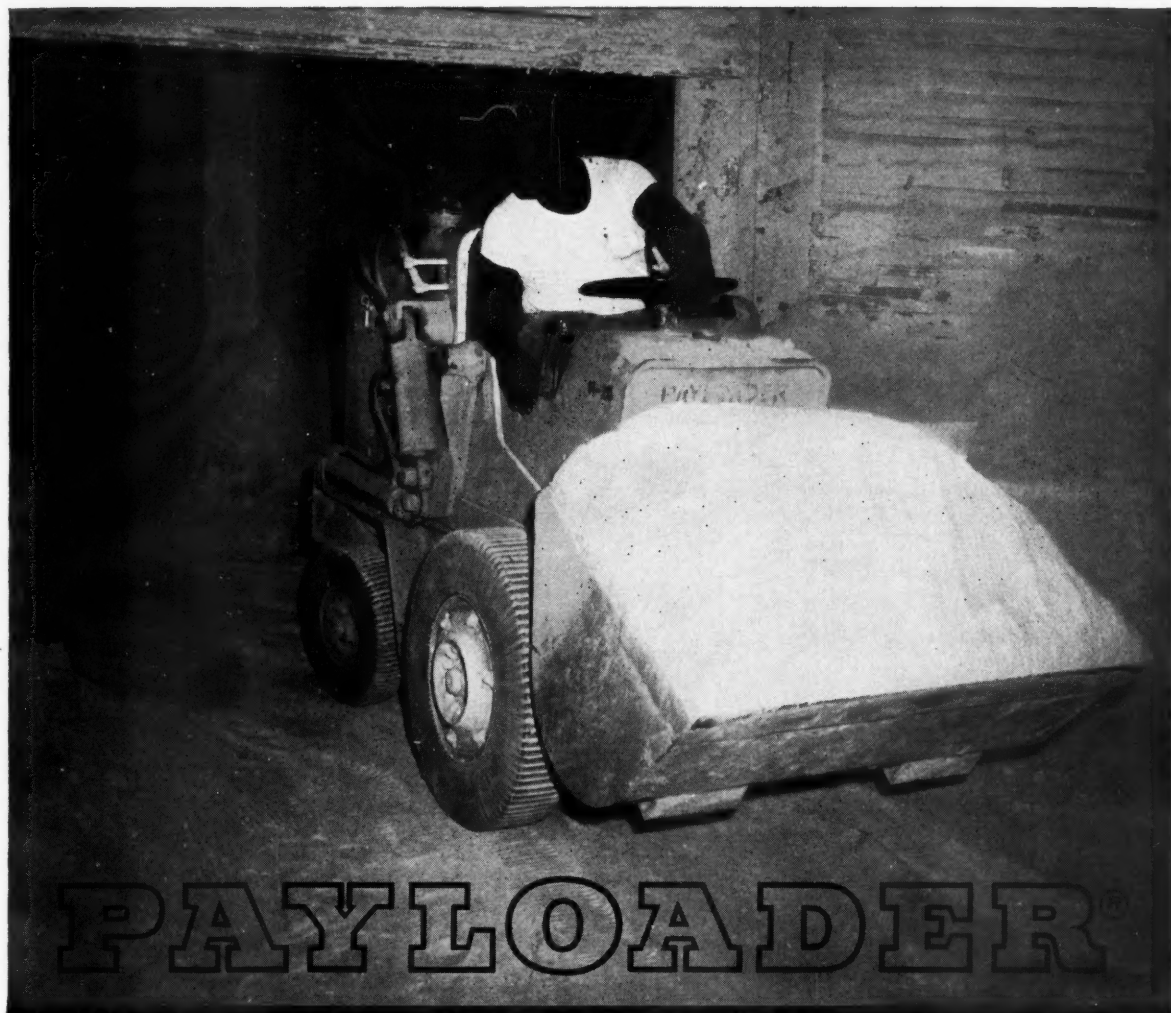
Another two-day meeting was attended by 20 more "Bumpero" dealers in Atlantic, Iowa. Ralph Everett, sales consultant, was employed to organize the curriculum and to spearhead the details of the meetings. Leonard Brannan, vice president of Farm Fertilizers, presented the technical portion of the two meetings. The class motored to actual farms in the area.

## STEPAN REPORTS RECORD SALES AND EARNINGS

Stepan Chemical Co. reported record sales and earnings in the nine months through September 30. Net profit was \$901,301, or \$1.34 a share, a jump of 48.3 per cent over the \$607,545, or 91 cents a share, reported in the same period last year.

Sales totaled \$16,535,797, or 29.6 per cent above the \$12,758,244 of the similar nine months of 1959.

FARM CHEMICALS



## "H-25 proved its production efficiency..."

over the other machines during the competitive demonstration we held before we purchased it", says R. P. Reinke, Plant Superintendent of Florida East Coast Fertilizer Co., Homestead, Fla. "We have been PAYLOADER users for nine years, with all-around satisfactory service. Our first unit, a Model HA, is still in service. Our present fleet consists of three HA's, and the new H-25 that has now completed its first season with only normal maintenance. This new design is 20% more productive due to power-shift, power-steer, faster loading speed, better load control, less spillage and faster delivery."

Owners' reports on the H-25 praises its high output, dependability and low maintenance. Mechanical excellence and extraordinary protection against dust and dirt are the two basic reasons for this.

**Mechanical Excellence** includes the Hough power-shift transmission—exclusive in its class with two speeds forward and reverse; power-steer; power-transfer differential; 4,500 lbs. breakout force; 2,500 lbs. operating capacity; shortest turning radius of only 6 ft.

**Extraordinary Protection** includes triple air cleaner system; cartridge-type filters on all three oil systems; sealed self-adjusting hydraulic brakes; enclosed parking brake; special grease and oil seals on all vital points. Your Hough Distributor wants to show you what this tractor-shovel can do. See him soon, or return coupon.

# HOUGH®



THE FRANK G. HOUGH CO.  
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PAYLOADER units  
and the many  
attachments.

# WHAT'S DOING IN THE INDUSTRY

**F  
C**

## SOIL FERTILITY SWEEPSTAKES

Spencer Chemical Co. is sponsoring what it calls a "Soil Fertility Sweepstakes" to encourage farmers to sign a "profit pledge." This pledge is to consult the fertilizer dealer for advice in planning a profitable fertilizer program. Spencer hopes to be responsible both for producing greater interest in the use of fertilizer and in promoting more dealer-farmer contact.

The farmer's signed pledge card mailed to Spencer enters him in a sweepstakes drawing which has as its top prize all the fertilizer his land can profitably use in 1961. The estimated value is at \$2,500. The offer closes at midnight, February 15, 1961.

## E-Z-FLO ACQUIRES INLAND'S AG CHEM BUSINESS

E-Z-Flo Chemical Co., division of Consolidated Industrial and Agricultural Chemicals, Inc., announces its acquisition of the agricultural chemical business of the Inland Chemical Corp. E-Z-Flo is building a new warehouse and offices in Plymouth, Ind., which will be headquarters for the operation but will also continue to operate from Nappanee, Ind.

## POTASH PLANT SLATED BY TEXAS GULF

Texas Gulf Sulphur Co. will begin construction immediately on a \$25 million potash mining and

processing plant in southeastern Utah. At a special meeting, the board of directors authorized the exercise of an option to acquire extensive potash reserves near Moab, Utah. Claude O. Stephens, president of the firm, said the new plant is designed to produce annually up to "well over a million tons of muriate of potash."

## WARF FORMS PESTICIDE DEPT.

The Wisconsin Alumni Research Foundation announces the formation of a pesticide dept. It will include the former Insecticide Testing Laboratory and expanded facilities for testing and screening of compounds for activity as herbicides, fungicides, nematocides, bactericides, algacides and others. A 10,000 square foot building has been remodeled and will house the entire department. Among the services made possible is a 1,000 cubic foot Peet-Grady chamber for more accurate measurement of activity of household aerosol fly sprays.

Acting head of the department is G. E. Schmolesky, assisted by C. D. Kuzdas.

## AMER. CYANAMID APPOINTS ADMINISTRATIVE ASSISTANT

The appointment of Patrick O'Conner as administrative assistant to the marketing director of American Cyanamid's Agricultural Div. was announced by E. H.

Smythe, director of marketing. O'Conner had previously been manager of budgets for the Agricultural Div.

## CHEMISTRY AND TECHNOLOGY OF FERTILIZERS PUBLISHED

Reinhold Publishing Corp., 430 Park Avenue, New York 22, N. Y. published *The Chemistry and Technology of Fertilizers* on November 21. It is edited by Vincent Sauchelli and sells for \$18.00.

The book is a survey of the chemical fertilizer industry. Leading authorities in the field discuss raw materials used in chemical fertilizers and conversion of these materials to suitable chemical compounds for feeding of crop plants.

Among the topics discussed are the factors controlling the preparation of conventional mixed fertilizers, the caking problem, the theory and practice of drying and cooling fertilizers, liquid fertilizers and corrosion and methods of preventing it in the manufacturing process.

Extensive coverage is given to phosphate ore, its mining and processing, nitrogen compounds and potash salts. The book also includes a detailed description of the processing equipment used in a modern plant.

This book is directed to the reader who is engaged, or expects to be engaged, in the fertilizer industry.

## PACIFIC PLANT FOOD ASS'N. ELECTS OFFICERS

Pacific Northwest Plant Food Association elected new officers and directors at its November 4 convention in Boise, Idaho. They are: president, Harold Rud, J. R. Simplot Co.; vice president, Dick South, Hansen and Peterson, Inc.; treasurer, Art Burkette, Chas. H. Lilly Co.; directors, C. L. Cummings, Huntington-Cummings Co.; Don Burlingham, Woodburn Feed and Supply Co.; Ross Hansen, Phillips Petroleum Co.; Glen Holt, U. S. Borax and Chemical Co.; Elwood Lentz, Western Phosphates, Inc.

New members of the association are Agriform Co., Boise Cascade Corp., Clark Tank Lines Co. and Hooker Chemical Co.

## Meeting Highlights

### NEXT MONTH:

### Southern Weed Conference 14th Annual Meeting

*Hotel Soreno, St. Petersburg, Florida*

**January 18-20.** Chairman of the program for the meeting is Ellis W. Hauser of the Georgia Experiment Station, Experiment, Georgia. The latest trends and test results on use of herbicides to control weeds in the South will be discussed.

The program will include sections on weed control in specific crops, control in pastures and turf, brush and weed control in non-crop areas, fundamental aspects and control of specific weeds, horticultural and aquatic weed control, extension aspects, public health aspects and new developments.

Conference President Robert A. Darrow of Texas A. and M. College urges all who plan to attend to make their own hotel reservations early. The Soreno Hotel will be the headquarters.

# The Big Sheaf...



*The 1960 U.S. wheat crop is estimated to be 1,368 million bushels, the second largest on record. And much of it is produced by the subscribers of a single publication, SUCCESSFUL FARMING—who in 1959 accounted for 62% of the nation's wheat harvested for grain.*

SUCCESSFUL FARMING farmers also in 1959 harvested 66% of all U.S. corn, 52% of all soybeans for beans, and 69% of all oats. Big crops take big applications of both fertilizer and farm chemicals to promote growth, control pests, and to maintain the soil in top fertility.

SF farms are big, average more than 300 acres, 50% larger than in 1945.

And SUCCESSFUL FARMING families are in the big income brackets. For the past decade, SF farmers' annual cash

income from farming alone has been about 70% higher than the annual U.S. farm average.

SUCCESSFUL FARMING gives your farm chemical dealers local support. It opens doors and minds, enjoys the respect of readers, delivers prestige and influence based on 58 years of service, helping farmers get higher yields and profits.

With 1,300,000 circulation in the National Edition, SUCCESSFUL FARMING reaches the nation's best farmers. And SF State and Regional Editions provide infinite flexibility, match individual needs for seasonal selling, stepping up sales messages, putting on more push, copy testing and merchandising.

For more farm chemicals sales, you need SUCCESSFUL FARMING.

Ask the nearest SF office for full facts.



MEREDITH PUBLISHING COMPANY, Des Moines . . . with offices in  
New York, Chicago, Atlanta, Boston, Cleveland, Detroit,  
Los Angeles, Minneapolis, Philadelphia, St. Louis, and San Francisco.

# MARKETING EXPERTS, **FCMS**

## '60 INDUSTRY MANAGEMENT

### EXCHANGE EXPERIENCES

*Marketing experts and industry leaders charted the courses for "Marketing Action" in these sessions*



Eugene Mapel



John Gillis



Henry Bund



Stuart Bear



Don Scott



Louis Backer



M. E. Wierenga



Hector Lazo



J. M. McCoy, California Chemical; Elmer Mathies, Reed Chemical, Texas; John Cronk and Loy Everett, Commercial Solvents, note-taking.



Five men at table: C. Harold Cunningham, Rohm and Haas; Ray DeNagel, Barker Chemical; Don Julien and H. L. Straube, Stauffer Chemical; Ed Streich, Allied Chemical.



Front: Jokl, Gross, U. S. Steel; Steinen, Lavelle, Naugatuck Chemical. 2nd Row: Sullivan, Monsanto; Lewton, Chemagro.



Front to right: Jack Miller, Atlas Powder; Dallas Cantwell, Southern Nitrogen; Frank Best, Spencer Chemical.



At luncheon are A. Livingston, Chemical Insecticide; C. Case, Cornell Chemical and Equipment; J. Hood, Geigy Agricultural Chemical; W. Crist, Morton Chemical; G. Robinson, Nuodex Products.

*Almost as valuable as formal sessions were these "idea exchanges"*



Conversing: Jack Miller, Atlas Powder and Jack Vernon, Food Machinery & Chemical.



The three men at the table are Ed Streich, Allied Chemical; George Oliver and Mel Wierenga, California Chemical.

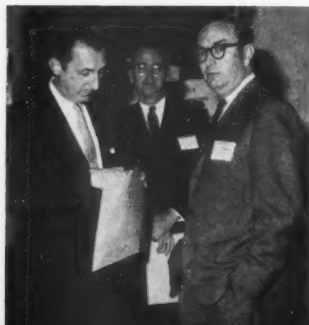


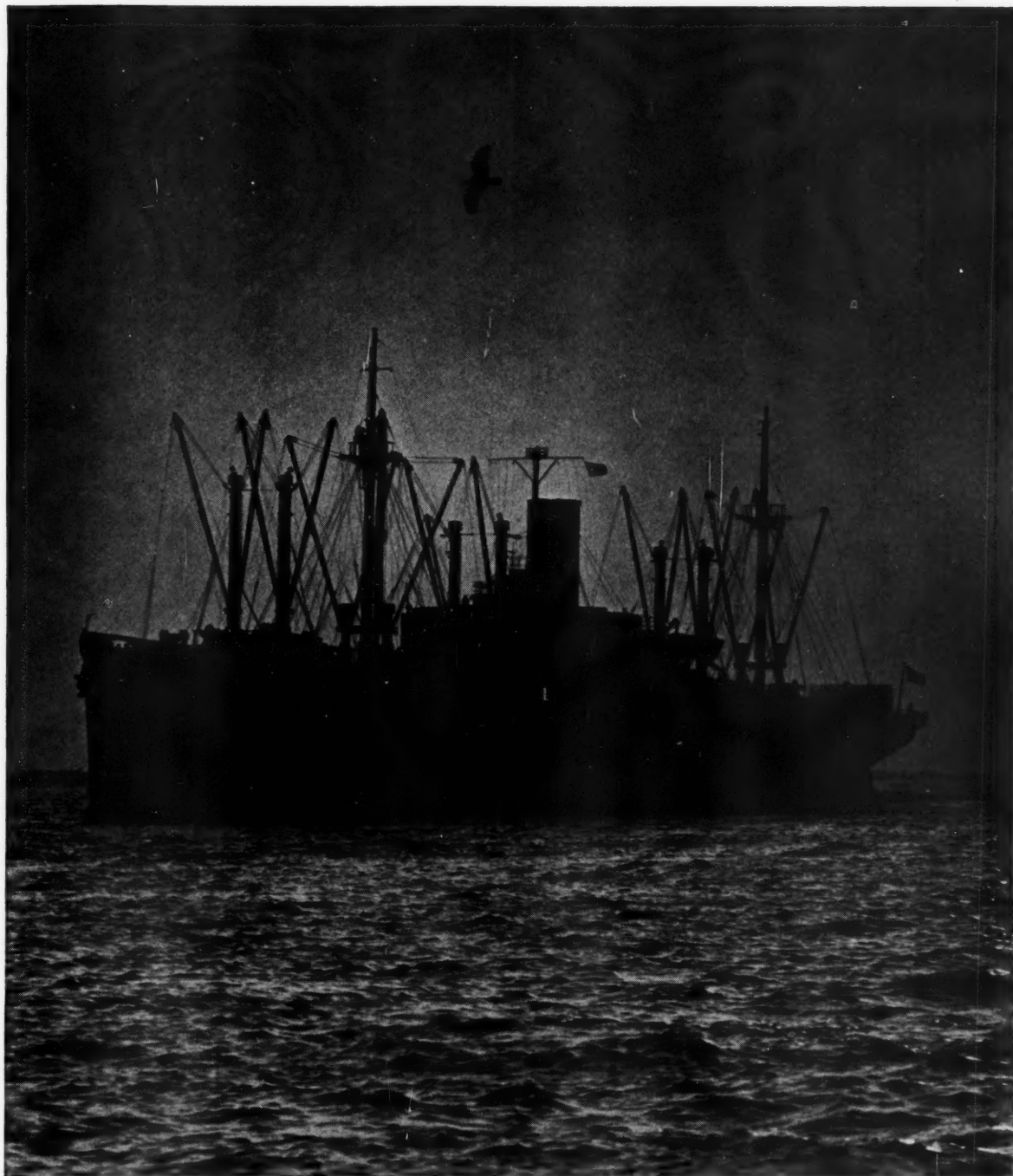
Foreground: Ray DeNagel, Barker Chemical; C. Harold Cunningham, Rohm & Haas; Webb Morrison, Smith, Kline & French; Frank Callahan, Ciba.

C. Hutson, MacManus, John & Adams; M. Gross, U. S. Steel; Dr. L. Goyette, Va.-Carolina Chem.



Between sessions: A. F. Buter and Tom Collins, Allied Chemical with Earl Stripling, California Chemical Co.





## IS there a urea so good it's worth going 3000 miles for?

There is. It comes from Cobelaz of Belgium—and no one else. It is probably the most unusual urea prill available in America today. People who have used it consider it the best.

It's the urea that goes contrary to all the old notions about prills—it's *uncoated*! Very much to your advantage. These prills are so skillfully made you get less moisture than with coated material. They are guaranteed

to be free-flowing. You get better storage. You get no dust. And—you get a guaranteed 46% nitrogen at the same price as 45% material!

As the first step to seeing how much better these urea prills can do the job for you, we would like to send you a sample and additional information. We are sole agents in the U.S. for Cobelaz of Belgium. Storage stocks are located near all major consuming areas. Write

today for sample and delivered price.

**H. J. BAKER & BRO., INC.**  
600 Fifth Avenue, New York 20, N. Y.

Branch Offices: 208 South LaSalle Street, Chicago, Illinois • 501 Jackson Street, Tampa, Florida • Savannah Bank & Trust Company Building, Savannah, Georgia • 361 East Paces Ferry Road, N.E., Atlanta, Georgia.



Established 1850

# WASHINGTON VIEWPOINT

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► *What's the outlook for farm business in '61 under the Kennedy Administration?*

► *Basic changes in farm policy are in the mill, but won't be ready for Congress much before March. Wheat program change may be the only congressional action.*

**Election of Senator Kennedy as President** has firmed up the outlook for farm business in 1961. It has a direct bearing on farm prices and income—and farm spending—because of Kennedy's plan to use the gov't. to raise farm income. The outlook for 1961 is for general improvement without a change in Federal government, and it is expected that the change will add a little zip to it.

*The outlook for farming in 1961 is this*—before adding in the Kennedy administration: Farm cash receipts will rise moderately in the first half of 1961 mainly because volume of marketings will be 3% greater than a year ago. The cost of production generally in the new year will be little different from this year. Average level of production costs is not expected to rise next year—and that would be the first time without a rise since 1953. Farm prices are going into the new year at higher average levels than a year earlier. Net income in 1961 is expected to be somewhat higher during the first half than the previous year.

**So first half of 1961 will be better** regardless of government changes. It's the second half when trouble may come . . . particularly if production again is a record, as it probably will be, and if livestock prices fall.

When the Kennedy influence is added to the "natural" outlook, you come up with this overall view: The second half of the year is when this influence will make itself felt most, because the 1961 crops provide the first opportunity for program changes. We look for some tightening of production controls, most likely on wheat, but nothing really drastic in 1961. And some increases in price supports are probable—most likely on wheat, cotton, feed grains and dairy products. Such increases, however, will be only tokens. Still they will inject a bullish psychology on the part of farmers. All these actions can be taken by administrative actions without new legislation.

Net result is that farm income during the first half, at least, will be up. Depending upon how much the new government does, farm income in the second half will be somewhat higher too. Farmers are entering the new year with a great deal more optimism than they had last year. It means that fertilizer, pesticide, machinery and equipment sales probably will do considerably better than the relatively poor showing last year.

**As for basic changes in farm policy**, they are in the mill now, but Kennedy's men won't have them

ready for Congress much before March. And even then, we believe he'll have trouble putting his ideas across because the potentially higher food cost would offend the city voters. A change in the wheat program is about all you can expect for next year's congressional action.

How does the farm vote affect Kennedy's attitude toward farmers? They voted for Nixon on the basis of religion, peace and other issues which more than cancelled out the farm issue. This applies primarily to Western and Midwestern farmers since much of the Southern farm vote did go for Kennedy. Actually, Kennedy owes nothing to the farm vote, but how this affects farm policy in the long run is still to be determined. There's no doubt he will keep an eye on the city vote, but his basic farm program ideas have built-in welfare for farmers . . . whether he now is enthusiastic about it or not.

**Farmers have taken a big step out of politics**, according to analyses of this election. In the past farmers held the key in Presidential races and especially in close elections such as this one. But there now just aren't enough of them anymore to be much of a cohesive force in national elections. Farmers helped swing some states to Nixon in West and Midwest. In the big states which bulk so large in the electoral college vote, farmers also voted for Nixon, but were overwhelmed by the big cities.

It means that farmers are on their own; take a back seat to such "blocs" as labor, Negroes, and other groups who went for Kennedy. We believe that while Kennedy will stick with the direction of higher farm income and tighter controls, he will move a lot slower now that the farmers at least indirectly indicated that they aren't too concerned about federal farm policy.

**What about Kennedy and taxes?** He is not committed on definite changes in federal tax policy and is expected to aim at overhaul of the tax system after studying it for some time. He is generally expected to close a number of "loopholes" over the next few years. Also, taxes generally are expected to move higher under his Administration.

Uppermost in the minds of Kennedy's tax advisers is how tax policy can be used to reverse a further recessioning of the national economy—if needed. If recession gets worse, we would expect Kennedy to forgive or reduce withholding for a limited period of time—to stimulate the economy. Withholding tax may be cut in half, for example, or even abolished entirely for a period of four or five months. (Continued on page 14)



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# What's Coming Next Month

What will 1961 be like? Well, if you're in business to make *money* it will be important to you to know what successful companies are planning to do next year. This month we're providing you with marketing patterns of such companies as California Chemical Company; Monsanto Chemical Company; and Niagara Chemical Division, Food Machinery & Chemical Corporation. Don't fail to read the article on page 24, so that you can set your own pattern of success for the 60's. We'll bring you the *second* of an outstanding series of marketing articles that came out of the magnificent second annual Farm Chemicals Marketing Seminar (FCMS) last month.

## ■ THE MONSANTO STORY

What does a farm chemical company do to establish a new image? Monsanto was a widely dispersed marketing organization until its reorganization took place recently. John Gillis, vice president in marketing, will take us step-by-step into his company next month and show how they reorganized to establish the name of Monsanto as a producer of successful farm chemicals.

## ■ SELL "ENUF"

Here's another story that's just getting around to being told. Two years ago a Solutions dealer realized that in order to build volume it would be necessary for him to sell his present customers on higher levels of application. This story will show you how his principle of sell "ENUF" paid off.

## ■ MORE ON THE ROUND TABLE

The second day of the Fertilizer Industry Round Table held last month in Washington, D. C. will be brought to you. One popular subject to be covered: Preneutralization.

*Treat yourself to a more successful year in 1961 by cashing in on the ideas . . .*

**... in the new**

**FARM** **BPA**  
**CHEMICALS**

## WASHINGTON VIEWPOINT

*More liberal depreciation* is another probability if an economic stimulant is thought necessary. Easier tax write-offs, for example, would probably induce greater industrial outlays for plants and equipment. The corporation income taxes probably will be continued as-is another year even though they are again scheduled to drop by 5 points next July 1.

### What kind of loopholes are they looking to close?

"Liberal" congressmen almost pulled it off last year and it is known that Kennedy goes along with them. Hottest item here is the withholding tax on dividends and interest. It's got priority in the Kennedy camp as a place to plug a big revenue leak. Could permit government to pick up another billion dollars in tax receipts. Repeal of the 4% dividend credit for individuals is another item with high priority. This in effect would mean a tax increase for millions of investors. Expense accounts is another area where further tax tightening is probable. While there is lots of talk about depletion allowances, we doubt that anything of major importance will be done on that for some time to come.

For what will be tried on the longer range on taxes we can do no better than to refer you to a publication put out by Big Labor—as giving perhaps the best idea of where Kennedy may go. Send \$1.50 for "Federal Taxes," to AFL-CIO, 815 16th Street, N.W., Washington 6, D. C.

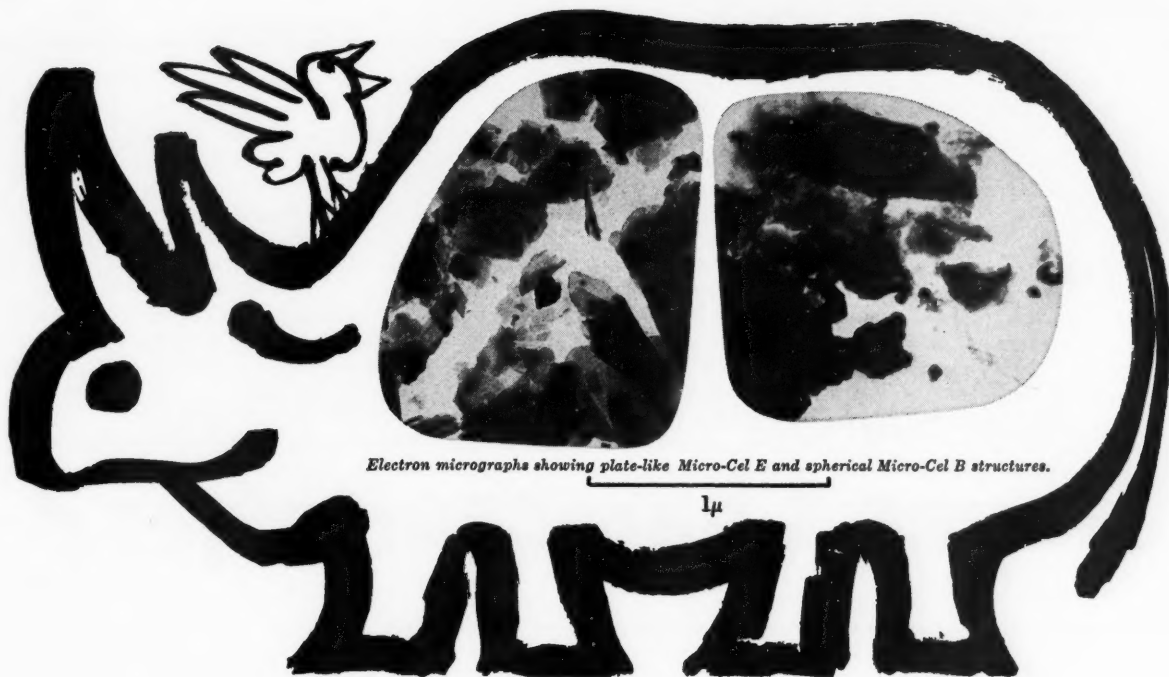
Here's a partial list of what labor is seeking, and labor, of course, feels it has a lot coming from the new President: Tax all capital gains at regular income rates—allowing investors to spread gains over the period an asset is held, and tax unrealized gains at death. Eliminate tax benefits of stock options. Tax state and local bond interest. Change depletion allowances to make them the same as depreciation. Kill fast depreciation methods allowed by current tax law. Cut tax on small corporations but raise rate on those having more than \$25,000 profit. Cut income taxes for upper brackets as well as lower brackets. The union leaders now are said to recognize that top rates are not doing what they're intended to do.

**Now what about federal regulatory agencies and Kennedy?** It is expected that Kennedy will take quick control of regulatory agencies—and seek stronger action. The expectation is that there will be tougher regulation of most business. While Kennedy is not believed to be "anti-business," he does believe in Big Government.

On the Food & Drug Administration, we expect that the next President would give it a big boost with funds and manpower—more inspectors.

Federal Trade Commission will be beefed up and given more momentum. This push is expected to come primarily from the new Vice President, Lyndon Johnson, who "believes" in FTC work. Overall on the regulatory agencies, business will be dealing with new men and new faces and a somewhat cooler climate to business problems—replacing the comfortable old relationships of the Eisenhower Administration.

FARM CHEMICALS



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☐ Please have your local Sales Engineer contact me.

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Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ County \_\_\_\_\_ State \_\_\_\_\_



## Why Study Buyer Characteristics?

Eighth article in FC's Salesense Series

By O. C. MERRETT

*Before we start discussing different buyers, I want to be certain I make one point clear. No buyer, customer, prospect or purchasing agent likes to be classified or typed. Having a backlog of knowledge about each customer or prospect can, however, be valuable to you if it is properly used and guarded.*

*I suppose there are as many different buyer characteristics as there are methods for working with them. We have found the study and treatment of the different types of prospects, customers and buyers so helpful to salesmen that we devote a lot of time to this particular part of our course and sales clinics. We concentrate and drill on 30 different types. Salesmen become so enthusiastic about this knowledge that they always ask for more drill on recommended treatment. The ones we have found most interesting wherever we go, are the (1) Grunter, (2) Good Natured, (3) Talkative, (4) Woman, (5) "Let Him Wail", (6) Gloomy Gus, (7) Procrastinator, (8) Checker, (9) Snob, (10) Hostile, (11) Kidder, (12) Suspicious, (13) Kick-Back Seeker, (14) Horse-Trader, (15) Boxer, (16) Argumentative, (17) Looker, (18) Shopper, (19) Bargain Hunter, (20) Amateur Expert, (21) Shy, (22) Price Minded, (23) Undecided, (24) Hesitant, (25) Decided, (26) Chiseler and (27) Ideal.*

**I** WAS TEACHING a sales clinic for a company a few years ago, and we were discussing the different type customers. The president of the company to whom I had sold our services was taking part in the clinic. After the session was over, he came up to me and said, "Merrett, I really liked this session. I feel as though this customer information will be most beneficial to our salesmen." I thanked him.

He then said, "By the way, when you called on me to sell me this clinic, how did you classify me?"

Before thinking, I said, "Oh, about the average."

The minute I said this, his expression changed. He excused himself and walked away.

No one likes to be just *average*. The same goes for

being typed Grunter, Know-It-All, Suspicious, Self-Important, Procrastinator, Checker, Snob, Undecided, Decisive, Hostile, Kidder or Talkative.

One question I am constantly asked is, "Why are some customers so nice when they come into our store, but when I call on them at their place of business they become downright nasty?"

I have not noticed this too much, but I do know that it can happen. This type of person is looking for a feeling of importance. When you call on him, he has you on his home ground. He knows that there he is boss. Chances are he has been mistreated in some place of business other than his own, and he is making up for this mistreatment by mistreating you.

When a call is made outside the salesman's place of business, there is a tendency on the part of the recipient of the call to show certain characteristics which would not be displayed were he in the salesman's place of business. These must be regarded as traits of character, but only for the purpose of knowing how to best approach the type person represented.

Let's listen in on the Grunter Buyer working on a beer salesman I know.

SALESMAN: "Mr. Prospect, if we could increase your beer sales, you'd at least want to know about it, wouldn't you?"

GRUNTER: "We are doin' all right."

SALESMAN: "Do you have any merchandising problems?"

GRUNTER: "Maybe."

SALESMAN: "What are they?"

GRUNTER: "Oh, the usual problems."

SALESMAN: "What do you mean . . . the usual problems?"

GRUNTER: "Oh, just run-of-the-mill problems."

SALESMAN: "What kind are they?"

GRUNTER: "Same old problem."

### THE GRUNTER

This man will sit there and *grunt* you to death. Sometimes he is inclined to be gruff and will give short, curt replies, usually using single words for affirmatives or negatives.

There can be *one of three* reasons for this type customer.

No. 1, he is just the Silent Type . . . doesn't like to talk and can't take part in a conversation.

No. 2, he has learned to sit still and let the salesman do all the talking. While the salesman is going all the way through his presentation, he is making mental notes. When the salesman has completed his sales talk, he starts tearing it apart piece by piece. This fellow can make you wish you hadn't been born.

No. 3, frequently this man is afraid that by talking he will allow himself to be persuaded.

*How can you cope with the grunter?* One thing is certain . . . You must get him to talk, and you can't expect to do this by asking him questions he can answer with a "Yes" or "No."

We can find something about everyone we meet to compliment him on, and do it sincerely; so pay him a compliment by asking his opinion on something. Here are some examples:

- 1) "Mr. Prospect, since you are an expert in this field, what is *your* opinion of this?"
- 2) "What would you say are the most outstanding advantages and disadvantages of . . ."

#### THE GOOD-NATURED CUSTOMER

This buyer is very talkative and jovial and will agree with almost everything you say. He listens for only one thing, and that is when you ask for the order. Although he will express enthusiasm for what you have to offer, he will balk and come up out of his chair when he hears the words, "Approve here."

Ask him questions about a selling point you have previously stated, and seven out of nine times, he won't know what you are talking about. Keep asking questions of this type until you are certain he is listening.

This type buyer is well trained and will have you out the door before you know what happened.

*His door act goes something like this . . .*

SALESMAN: "Mr. Prospect, from the enthusiasm you have shown for our product, I can see that you would like to get this in stock as soon as possible. Now, if you will approve this order, we will get this to you the first thing in the morning."

CUSTOMER: Jumps to his feet, reaches down, catches you by the arm, pulls you up and starts walking you toward the door. All the time he is patting you on the back with his other hand . . . telling you how nice it was of you to stop in, and to stop in again the next time you are out this way.

You start walking down the street thinking, "Boy! He's sure a fine fellow!" *Then . . . it hits you!* You didn't *sell* him anything.

Nope, you sure didn't, and you won't the next time either, unless you make certain he is listening to your sales points.

#### THE PROCRASTINATOR

This fellow has caused many a salesman to turn in his sales kit and ask for his office job back.

He has made a study of all the put-off reasons for not buying:

- 1) "I want more time to think about it."

2) "I'll need to talk this over with my wife."

3) "Leave me some of your literature and your card; I'll call you. Don't call me."

*Now here is where Prospect Knowledge really pays off.*

If you have done your home work, you found out in your Pre-Approach or Research that this fellow is a procrastinator.

If you are certain that you are going to get these stalls, why waste time going through your presentation? *Put him on the spot.* Do this right behind your Interest Step. You might want to try the following approach to this type prospect:

SALESMAN: "Mr. Prospect, when I am through demonstrating the benefits of my product, and you are convinced it will save you time, labor and money, are you in a position to make a firm decision to buy *NOW?*"

PROSPECT: "Why yes, I can make a decision, if that's what you want to know."

SALESMAN: "Then, Mr. Prospect, you will place your order *today*, with me, if you are convinced it will do what I have said it will do. Is that right?"

PROSPECT: "Yes. Go on with your demonstration."

You are wondering whether this isn't pretty strong. I would agree with you if there was any doubt about his being a habitual procrastinator; but if he is, there is no way you can lose. This way you stand a chance of getting a sale; the other way, all you can hope for is a put-off.

#### THE CHECKER TYPE BUYER

This prospect uses his only sales pitch, that goes something like this:

- 1) "I will need time to do a little checking."
- 2) "I will have to check with our maintenance superintendent."
- 3) "I will have to check with my home office."

Here is another buyer on whom your pre-call information can mean the difference between a sale and a put-off.

You will need to do a little extra homework to close this fellow. First, you must know that he uses this kind of put-off sales pitch. You will need all the Competitor Knowledge you can get your hands on . . . You especially need to know your product's advantages over your competitor's, and his over yours. You will need written and signed testimonials from satisfied users . . . particularly the ones you choose as references.

Find out early in your interview if he can make a decision to buy without conferring with anyone else. Try to get him to call the maintenance superintendent in while you are there. If he refuses, ask his permission for you to talk with him.

#### THE BOXER TYPE

This man is waiting for you with his boxing gloves on. His sole purpose is to get you into an argument or make you angry. *Don't let this happen.* He will find something wrong with everything you show him.

If you agree with him, he will ask you, "What's the matter? Don't you believe in your product? No

## MARKETING

### Why Study

## Buyer Characteristics? (Continued)

confidence in your service department . . . and you expect me to buy that junk!"

This is where you use your pads. You agree with him without saying you agree.

There is no place here for any selling cliches, such as:

- 1) "You can quote me on this . . ." He will say, "Why should I quote *you* . . . who are you?"
- 2) If you say, "I can understand why you would think that way, but . . ." he will stop you by saying, "What do you mean 'but'! But I can't think; is *that* what you mean?"
- 3) If you say, "I am glad you brought that up" he will say, "You are lying . . . You are *not* glad I brought it up."
- 4) If you should accidentally let this one slip, you had better start running:

"Mr. Prospect, I am going to be honest with you now . . ."

Prospect: "Do you mean you have been sitting there taking up my time lying to me? Why you . . . you . . .!"

*Keep complimenting him.*

- 1) "Mr. Prospect, you are the fastest thinker I have ever talked with."
- 2) "Mr. Prospect, it is easy for me to see why you have been so successful. You want all the facts laid on the line before you make a decision."
- 3) "Mr. Prospect, your being an expert in this field, I would surely like your opinion on something. What do you think of this?"

I repeat . . . don't let this man lead you into an argument or make you angry.

### THIRD PARTY INTERFERENCE

If we had all the money that has been lost in commissions due to third party interference, we could all retire tomorrow.

Let's take a look at the way a fleet truck salesman let a third party shake him up and cost him a sale.

The salesman called on a buyer who had an out-of-town visitor. The buyer didn't introduce the visitor to the salesman. The salesman didn't introduce himself to the visitor.

The salesman had information that the buyer owned a fleet of trucks and was unhappy with the service he was getting from them . . . transmission trouble, the cost of keeping them running and the severe down-time cost.

SALESMAN: "I am with the Bibco Truck Company. My name is Henry Bibco."

BUYER: "How are you? Have a seat."

THIRD PARTY: "That must be a one-man operation. I never heard of your company."

SALESMAN: (Ignoring remark) "Mr. Buyer, if there were a way to reduce your transmission problem, cut your cost by eliminating your down-time, you would want to know about it, wouldn't you?"

THIRD PARTY: "Ha, Ha! I've heard that bunk before!" (*Punches buyer.*)

BUYER: "I have too, but let's hear it."

SALESMAN: "Mr. Buyer, in order for me to show you just how much we can save you, let me ask you this . . ."

THIRD PARTY: "Better watch him, cousin, he's full of tricks." (*Nudges buyer with elbow.*)

BUYER: "Do you think he is? I'll keep my eye on him. Go ahead, Mr. Salesman."

SALESMAN: "How many trucks are you operating at the present time?"

BUYER: "Sixteen."

SALESMAN: "What would you say your average down-time is in hours out of each 24 hours?"

THIRD PARTY: "I told you. Man—is he nosy!"

BUYER: "Now look, all I want to know is . . . Do you have a better transmission?"

SALESMAN: "We sure do, and here . . ."

THIRD PARTY: (Interrupting) "That's what they all say! Cousin, don't you believe him . . . Why don't you get you some real trucks, like mine . . . Why, I never have any trouble!"

BUYER: "Is that right? What kind do you have?"

SALESMAN: (*Has completely lost control of interview.*)

THIRD PARTY: "Why, I've got the Tanco Truck . . . none better . . . never gives you any trouble . . . and they are \$150.00 per truck cheaper!"

SALESMAN: (To third party) "Are you a partner?"

THIRD PARTY: "Nope; just a friend."

SALESMAN: "Then why don't you keep your big, fat mouth shut?"

THIRD PARTY: "See what I mean, cousin?"

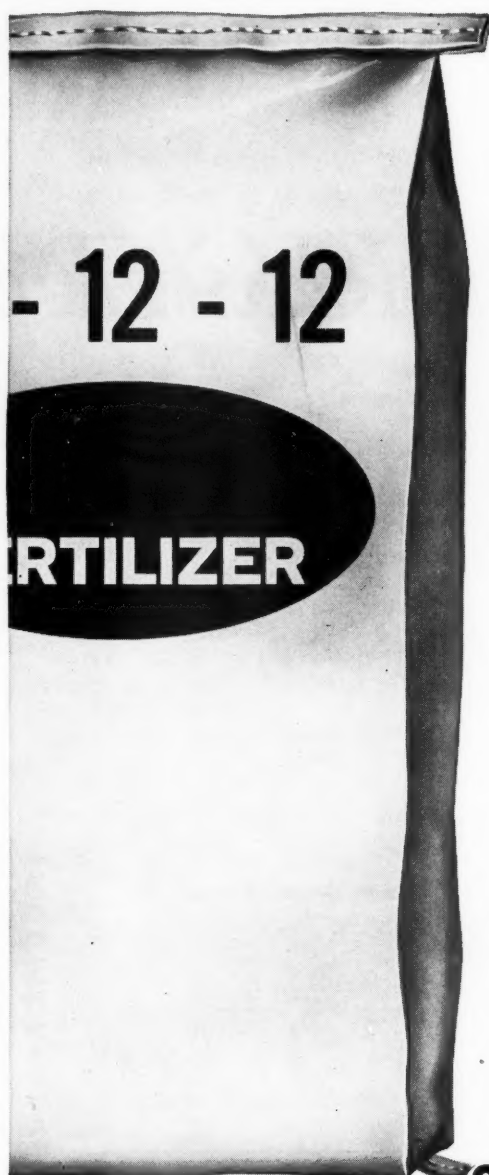
BUYER: "I sure do! And Mr. Salesman, I'll have you know you have insulted my friend, and I wouldn't buy your truck if it were the only truck made. Now GET OUT!"

Here are some tips that will help you get the Third Party to sell *for you*, not *against you*.

- 1) Get the third party on your side immediately.
  - A. Find out who the third party is.
  - B. Find out what third party's business is.
  - C. Find out third party relations to customer.
- 2) Third party could be one of these:
  - A. Wife
  - B. Husband
  - C. Daughter or Son
  - D. Relative
  - E. Friend, etc.
- 3) Do's and Don'ts for handling third party effectively.
  - A. Do not ignore third party.
  - B. Make him an ally.
  - C. Don't let third party get you into argument.
  - D. Get third party to sell for you.
- 4) Methods for getting third party to work for you.
  - A. Use an emotional word picture.
  - B. Pay him a compliment.
  - C. Solicit his opinions.

Selling is becoming more and more a science. Personal selling requires an individualized approach to the problems, needs, wants and habits of each customer, buyer or prospect.

The top-dollar salesmen study them so they can treat them the way they want to be treated. ▲



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## MERCHANDISING AIDS PROMOTION

# "How we measure

Last month we discussed the departmental system employed by Murray C. Renick, manager of Rolla Feed Mills, Rolla, Missouri, as an aid in helping him measure profits. We discussed his various merchandise divisions and his profit and loss statement.

This month we will delve into the all-important last column (8) of his report to see how he arrives at his "gross profit per dollar of inventory"—and what it really means.

### PROFIT AND LOSS RATIOS Departmental Detail

Departments	(1)	(2)	(3)	(4)	(5)	(6)		(7)		(8)
	Sales	% of Total Sales	Cost of Goods Sold*	Gross Profit	Closing Inventory	Gross Profit Rate		Inventory Turns Yr.		Gross Profit per Dollar of Inventory
						Actual	Norms	Actual	Norms	
Grain	\$103,078	17.6%	\$85,515	\$17,563	\$ 2,215	17.0%	5-10%	38.6	Seasonal	\$7.93
Chows	106,733	18.3	89,967	16,766	4,144	15.7	11-15	21.7	15-25	4.05
Flour, Sugar, Meal	42,397	7.3	37,852	4,545	2,819	10.7	10-15	13.4	5-10	1.61
Wire, Twine, Rope	27,087	4.6	20,818	6,269	9,642	23.1	25-30	2.2	3-5	.65
Raws	61,041	10.4	43,079	17,962	4,205	29.4	10-15	10.2	5-10	4.27
Manufacture	60,134	10.3	48,917	11,217	606	18.7	—	80.7	—	18.51
Farm Supplies	33,573	5.7	27,289	6,284	7,860	18.7	25-30	3.5	3-5	.80
Seed	71,481	12.2	51,505	19,976	5,863	27.9	15-20	8.8	Seasonal	3.41
Miscellaneous	12,974	2.2	11,204	1,770	1,005	13.6	—	11.1	—	1.76
Total Business**										
All Departments	\$584,994	100.0%	\$498,026	\$86,967	\$47,668	14.9%		10.4		\$1.82

ANALYTICAL REPORT

\*Does Not Include Freight.

\*\*Because one department was deleted from this form, the "Total Business All Departments" does not "add up" as shown.

**Note on Cols. 5, 7 and 8**—Are the closing inventory figures in Column 5 typical of the inventory throughout the period? If so, figures in columns 7 and 8 are meaningful. If not, it will be necessary to make allowances in interpreting them.

**Note on Col. 8**—Figures in this column can be very useful if closing inventory is typical, but care should be used in interpreting them. Remember figures relate only to Gross Profit and not Net Profit (no Expenses being taken into account); also figures are based upon investment in Inventory only and do not take account of any other investment necessary to maintain the department. (No figures are shown when department is highly seasonal or has negligible inventory.)

**Note on Norms**—The Norms given indicate typical successful experience for well-rounded Farm Supply Stores. Deviation may frequently occur as the result of local conditions, the particular combination of items in the department, etc. These Norms should be valued for general guidance only and should not be considered as a perfect measuring stick for any individual business.

# e PROFITS"

**Y**OU'LL see that in *column 4* in the report on page 20 that "gross profit" is \$8,691 for fertilizer. In *column 5* "closing inventory" is \$9,306. Dividing the latter figure into the former, Renick arrived at \$.93 as his gross profit per dollar of inventory (*column 8*).

Now note that the gross profit per dollar of inventory for the *entire business* is \$1.82. Again, this figure is the result of dividing the gross profit by the closing inventory for the entire business.

Renick says that \$1.82 is "too low." Even though his gross profits rates are higher than norms, in most cases, he said he's not satisfied with this, to which FARM CHEMICALS would like to add:

How many dealers really know how each of their departments is doing? Are they making progress or going down-hill? Renick has a clear view of where his problems are—where he has to spend more time improving his over-all situation. Renick can check his past with his present and can build from there.

"Having this system available to us gives us an opportunity to study and have a better management program," Renick told FARM CHEMICALS.

"We know that in a farm supply business the employee's sales per month should be \$4,500 to \$5,500 and if our sales are less than this, we know that our employees are not selling or we are not handling saleable merchandise," he added.

## \$1 GROSS PROFIT FOR \$1 INVENTORY

It is generally recognized that in a farm supply store each department should bring in at least one dollar gross profit per dollar of inventory.

Study his grain department for a moment. The gross profit rate is 17 per cent! (The norms are 5-10%.) (Divide *column 1* into *column 4* for GPR.)

That's a per cent figure, but we want *dollars*. So we can say he made 17 cents gross profit per dollar for each \$1 sale in this department, on the average. Pretty good, wouldn't you say? Now the next step is to ask, How much did he have *invested* in that little item that he sold for \$1?

The answer is \$.83, of course.

Thus the inventory investment was \$.83. Next, then, is to determine how much he made in gross profit for *each dollar of inventory* in this department.

We get the answer by dividing gross profit (*column 4*) by cost price (*column 3*). It comes out to \$7.93 (*column 8*).

DECEMBER, 1960



Renick's problem is to "get his inventories to turning more rapidly" in certain lines—one of them being fertilizer. On his profit and loss summary you figure inventory turns per year by dividing Cost of Goods Sold (*column 3*) by Average Inventory (*column 5*). In fertilizer, he turned his inventory 4.4 times—compared to 3.5 times for farm supplies. Norms for the latter are 3-5, while fertilizer is seasonal and more difficult to handle.

## FARMERS LOOK FOR FERTILIZER 'BARGAIN'

He says that many farmers are using fertilizer dollars to pay other bills. Also, they have the idea that they can always get a "bargain" on fertilizer—which isn't a very good situation for this industry.

When FARM CHEMICALS visited Renick, however, he had just let two old-time customers know that they were costing him too much money to deal with them.

"A dealer can't keep 'carrying' customers who don't pay up," Renick told FARM CHEMICALS. "So today I called these two fellows in and gave them an ultimatum."

He credits the ag colleges with helping dealers like himself.

"I'd have just kept doing business-as-usual if I hadn't attended the Grain Handlers Business Conference at the University," he said. "But sitting there yesterday listening to that marketing professor talk on credit made me realize that I couldn't *afford* to do business with those two guys anymore.

"Without a credit policy we were turning our accounts receivable every 38.2 days. Today, with a credit policy, we are turning our accounts receivable every 19.3 days. Even though we are doing a great deal more credit today, our accounts receivable are in excellent condition because of our credit policy," he concluded.

So what's the key to helping your dealers make a profit? Show them how to measure their operations! Departmentalized bookkeeping is a terrific way to get them started. ▲

## MERCHANDISING AIDS PROMOTION

### THE VALUE OF CREATIVE DESIGN for multiwalls

**A**S A means of determining whether a Creative Design Service for large volume users of multiwall bags would be justified, the Multiwall Bag Division of West Virginia Pulp and Paper Company undertook a cross-section sampling of industry reaction.

The industries polled included cement, feed, seed, fertilizer, and chemicals—products which in large measure move from factory to warehouse and are not too often seen on a store shelf. Because these industrial products are not considered objects of “impulse” buying as are items in supermarkets, printing, design and color on multiwall bags containing these products have had comparatively little attention.

With the competition among companies for industrial markets becoming as intense as that in the consumer field, West Virginia Pulp and Paper management concluded that the printing and design on the workhorse multiwall bag should project as an attractive and sales-appealing image of the product and as progressive an image of the company as appears on consumer packaging. Would our multiwall bag customers concur? Here is a brief summary of some of the findings:

*Most firms questioned want to “spread a bit of the sun”*

#### TYPE AND NUMBER OF COMPANIES RESPONDING:

	Number
Cement.....	8
Fertilizer.....	12
Feed.....	6
Seed.....	5
Chemical.....	7
<b>TOTAL.....</b>	<b>38</b>

#### QUESTIONS:

- 1. Do you attach more importance to color, design and printing on your multiwall bags today than you did a year ago? Five years ago?**

	More Today Than Year Ago		More Today Than 5 Years Ago	
	Yes	No	Yes	No
Cement.....	4	4	7	1
Fertilizer.....	7	5	12	
Feed.....	4	2	6	
Seed.....	3	2	5	
Chemical.....	6	1	7	
<b>TOTAL.....</b>	<b>24</b>	<b>14</b>	<b>37</b>	<b>1</b>

- 2. If you believe that industry has a growing interest in better multiwall bag design, to what do you attribute this trend?**

24—More intense competition  
9—Improvements in bag-printing techniques  
4—Internal packaging-improvement programs  
1—Need to do a better selling job generally

- 3. What in your opinion is the main advantage of good design in multiwall bags?**

11—“Emphasizes quality of product”  
14—“Keeps company name before customer”  
5—“Helps sell at point of purchase”  
4—“Good advertising for product and company everywhere bags are handled and seen”  
3—“Increases salesman’s pride in product and company”  
1—“No one advantage, but just good business”

- 4. How long has it been since the printed design on your bags has been revised?**

	Less than year	Over 1 Year	Over 5 Years
Cement.....	1	2	5
Fertilizer.....	3	3	6
Feed.....	2	3	1
Seed.....	1	3	1
Chemical.....	2	2	3
<b>TOTAL.....</b>	<b>9</b>	<b>13</b>	<b>16</b>

- 5. Are you satisfied with your current printed design?**

	Yes	No
Cement.....	5	3
Fertilizer.....	8	4
Feed.....	3	3
Seed.....	2	3
Chemical.....	5	2
<b>TOTAL.....</b>	<b>23</b>	<b>15</b>

FARM CHEMICALS

bit of the supermarket packaging magic on the now dowdy dress of this utilitarian drayhorse”

**6. What do you think should be emphasized more in multiwall bag design—the product or the company?**

	Product	Company
Cement.....	6	2
Fertilizer.....	9	3
Feed.....	6	0
Seed.....	5	0
Chemical.....	4	3
TOTAL.....	30	8

**7. What phase of design do you consider most important as a means of gaining added advertising impact for your product and company—Color? Quality of printing? Layout and design?**

	Color	Printing	Layout & Design
Cement.....	2	2	4
Fertilizer.....	4	2	6
Feed.....	3	0	3
Seed.....	2	0	3
Chemical.....	2	1	4
TOTAL.....	13	5	20

**8. Do you look for new design ideas to your advertising agency? Internally? Suppliers? Outside specialists?**

	Agency	Internal	Suppliers	Outside
Cement.....	4	3	1	0
Fertilizer.....	5	4	2	1
Feed.....	2	2	0	2
Seed.....	3	1	1	0
Chemical.....	4	1	0	2
TOTAL.....	18	11	4	5

**9. If you are in favor of revising your multiwall bag design, do you feel that minor changes would suffice? Or, do you think that designs more in line with supermarket packaging trends are called for?**

	Minor Revision	Closer to Supermarket
Cement.....	5	3
Fertilizer.....	5	7
Feed.....	2	4
Seed.....	1	4
Chemical.....	2	5
TOTAL.....	15	23



Your One Stop Service for

• NITROGEN • POTASH  
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FCMS experts set the

# FARM CHEMICALS Marketing PATTERNS

*The second Farm Chemicals Marketing Seminar (FCMS) is history. The two-day event was held November 15-16 at the Delmonico hotel in New York City. It is only appropriate that the moderator, Dr. Hector Lazo, chairman of the marketing department, Graduate School of Business Administration, New York University, and managing director of Marketing Counsellors, New York, summarize the proceedings for our readers.*

*In effect "you are there" as you read this vivid account of what the speakers told those attending the seminar.*

*We give you Dr. Hector Lazo . . .*

for  
'61

By HECTOR LAZO

**N**OW comes the challenging task of distilling, in a few minutes, the wisdom of days and the presentation of experts.

You noted the opening admonition of Eugene Mapel (vice president, Chase Manhattan Bank): An organization, no matter how structured, is no better than its conceptual foundation. *It has to take place in the mind and heart of top management.*

It is the senior executive who has the responsibility for setting goals, and his is the responsibility also for formulating the policies by which we propose to reach those goals. Naturally, both goals and policies must be specific.

*But they must also see the big picture of total marketing, not just selling. And organization is the set of relationships set up to execute plans and attain the objectives set by top management.*

You see how naturally, then, we lead into organized marketing. All the elements are recognized, accepted, organized and executed: research, strategy planning, education and communication, advertising, promotion, sales and, in best managerial tradition, performance measurement.

Gene Mapel gave us not only a masterly definition of marketing, but of successful management as well. And in the modern marketing concept, this is all customer oriented, with every detail of marketing strategy planned and a company's objective based on customer needs and objectives.

*All human and material resources of the company must be directed at solving the customer's problem in precise terms.*

Thus if we accept the premise that the essence of management is organizing work for effective perform-

ance, we need specific goals, we need specific policies or rules by which we reach our goals, and we need standards of measurement to determine how well we have performed and how closely we reached our goals.

It is obviously not enough to have a mechanical chart . . .

*Marketing is the job of the entire organization. The spirit and the energizing of the whole organization far transcends that of the chart or the sales force. The people who fill that chart, from top to bottom, must think and act marketing in all their activities.*

And you notice this starts at the *very top*—because marketing is the planning, organizing, policy-setting, action taking and performance measuring that is designed to give each employee the best chance to do the most effective job in each selling situation.

*Marketing is the skillful blending of research, advertising, product planning, selling and administration into a unified and profit-making whole.*

## HELP CUSTOMERS ATTAIN THEIR OBJECTIVES!

Top management today can no longer afford to depend upon the salesman to supply market information or to sell your product. Top management must take a long, hard look at management activities and see whether they are helping your customers to attain their objectives.

*The ideal marketing situation is one in which your product has a demonstrable superior advantage. But actually we know that such ideal rarely obtains.*

## SELLING THE "SMALL PLUS ADVANTAGE"

You do not have the world by the tail. So you must teach your entire organization—in fact, you

must teach your *customers*—how to get the result they want from your product. And often this may be a small plus advantage—but it is all the advantage you need if *all* your people “sell” it.

A necessary provision of a *good* organization is the provision for educating your own people—and your customers—on the value of that little plus. Because in modern marketing, every employee of the company must influence and persuade, and look at the marketing implication of every one of his acts. This means superior personnel. The good manager, therefore, is the one who gets the best out of the people available. For we must always remember that it is *people*, and not a mechanical chart of organization, that will solve our problems of the future.

### THE EXAMPLE OF MONSANTO CHEMICAL

But if that is what a marketing expert counsels from the vantage point of an observer of many businesses, how can management, confronted with specific problems in specific situations, apply his counsel in the light of the cold realities of an actual situation?

John Gillis (vice president in marketing, Monsanto Chemical Co.) took us step by step into his organization—an organization which until a few months ago was dispersed, and where handling of the products was widely scattered.

The carrying out of the carefully structured marketing plan at Monsanto Chemical obviously did not develop overnight. They have been 18 months at study and reorganization. The first major step has been taken. Where before they had disorder, they can claim to have progressed to confusion out of chaos. They feel they are on their way.

Monsanto's new organization dates from September 1, 1960. And more changes will inevitably follow. Various proposals were considered, some very intriguing ones, and many rejected because they were all measured against the primary yardstick: *will this help us to create a customer?*

A firm in business does not talk abstractly about planning and organization. Everyone has got to be concerned with marketing. It must be translated into specifics; and the place to start, even in a multiproduct firm like Monsanto, is with product planning for a specific customer need.

Products don't plan themselves, and if 80% of the products introduced into the market since the end of World War II have failed, certainly proper organization for product planning will minimize this risk and reduce this mortality.

*At Monsanto they reorganized to establish firmly the name of Monsanto as a producer of successful farm chemicals.*

But if products are the lifeblood of business, the rest of the company needs to be organized also. For successful business means successfully meeting and solving problems in terms of customer needs. In this function of management a proper organization is indispensable.

*And not the least of the important changes is staffing the new set-up and retraining the field representatives.*

You noted, too, how John Gillis, in terms of a company that can certainly claim to have been successful,

took Gene Mapel's principles and applied them as Gene Mapel stressed: from the top down; marketing-minded, with a strong executive background.

Thus, to John Gillis and Monsanto, Gene Mapel's principle of top management responsibility is translated into leadership; and leadership means discharging responsibility.

Perhaps in no area can we match principle with practice in business better than in executive leadership; without this, there is no management, no marketing, no profit. And without profits we can have no progress.

### ORGANIZING "SKILLS AND TALENTS"

One of the earliest advocates of organization and integration in marketing was Dr. Henry Bund (vice president of the Research Institute of America). Distilled from his experience in contacting thousands of business firms comes the principle of integration, within the marketing department and with other departments of the business.

Many skills and talents, previously semi-independent and even antagonistic to each other, suddenly find themselves in the same camp. They have not previously had to work together nor have they known how to do it. This, then, becomes almost the first challenge to marketing management: how to organize these skills and talents in the proper relationship to each other to do an effective, coordinated, integrated job.

*This naturally means that management must establish certain major policies: what degree of coordination is needed and possible? shall we decentralize? what does this mean in terms of delegation? just where and how far DO we decentralize, when we of course know we must at the same time control and measure? which functions do we decentralize?*

We are confronted, likewise, with important channel policy decisions. The marketing concept does not permit a manufacturer to stop his thinking at the corporate boundaries. Our job is not done until the user consumes our product; in fact, not then . . .

*... unless he comes back for more and thus approves our product, our policies and our actions. And this includes how we got our product to him: i.e. the channels we have used. Distribution involves people; it involves independent distributors who perform functions.*

How well do they perform them? How much does it cost to perform these functions which economists call “adding time and place utility,” (to which modern marketing has added, consumer convenience). The cost of distribution is constantly climbing. Now, at long last, marketing management gives us new answers to the perennial question: “Does distribution cost too much?”

But marketing must accept the standards of professionalism in judging its contribution. In particular, three standards:

(1) We must accept the fact that hunch and intuition—often referred to as “experience”—must give way to *facts*. Seat-of-the-pants management must go.

(2) Professionalism requires that all decisions be made on terms of *long-term objectives*. Hand-to-mouth performance must go. Planning responsibility

## MARKETING

### FARM CHEMICALS Marketing PATTERNS

(Continued)

places a particularly important obligation on the marketing manager who must not only achieve results *today*, but also plan for effective growth tomorrow.

(3) We must substitute *profitability* for volume of sales as a measurement of true sales performance—not just turning in a large volume of orders, but a sufficiently large volume of *profitable* sales to ensure progress and total profitable earnings.

This is the ultimate standard of marketing performance.

*And suddenly we see the meaning of integration and coordination. What Gene Mapel talked about, what John Gillis showed us was done at Monsanto, now suddenly all means part of a total planning scheme.*

We have to know how we are doing, and this means we must establish and accept professional yardsticks. The policy of measurement is not an easy one to determine or establish; but establish it we must for improvement can come only when we know exactly where we stand. And here again leadership must exert itself: are we after volume, or are we after profits? How can we insure our profitable, healthy growth through company policies? Since the final payoff is always the cash register, we will find our answers in our pricing policies.

And so we reach the point: we have set our goals; we have organized our skills and talents; we have made sure that we have some way of measuring our progress so our leaders may show us how to improve. And all along, we establish rules for conduct, we chart the map by which we will reach our goals, we give our staff performers guides by which we plan to accomplish our purpose.

*Do these guides work?*

#### HOW NIAGARA POLICIES WERE FORMULATED

Well, here is "Stu" Bear (manager, Niagara Chemical Div., Food Machinery and Chemical Corp.) who shows us just how policies are formulated and what these things Dr. Bund spoke about mean at the operating level. Here is a multiple-division company—like so many others these days—with divisional headaches and difficulties stemming from the choice of policies in what might be called an agricultural apothecary shop.

*There is always a choice; there are always alternatives. Which shall you choose? Why? What are the consequences? Well, here we see.*

Prior to reorganization—only two years ago—we had a highly centralized organization. But the policy decision was made to *decentralize*: what does this mean?

*First*, the problem of converting previously sales-minded supervisors to profit-minded managers . . . many of them could not even read a P&L statement before! (Note the importance of proper training!) It was a gigantic job of communications.

*Second*, the job of getting men brought up under a rigid centralized system to accept decentralized responsibility and authority: again, how do you educate

people to develop responsibility, to accept duties they have not had before?

*Third*, when drastic action becomes necessary, the organization is not ready: from top management on down you meet people problems, resistance, dealer antagonism.

*Fourth*: decentralized activity may call for a different channel policy. Unless you have prepared the ground, this means antagonism between departments, between and among salesmen, with the trade.

*Fifth*: in all policy decisions you must be prepared to make mistakes. And when you do, be ready to take the responsibility for them. Anticipate and thus minimize the consequences of error.

So much, then, for the first day. Now the second day!

We know what we should do, we know how successful companies have done it, and now we wrestle with the very practical and always limiting factor: it takes people to do it. Anything that people do involves trouble, involves compromising with existing limitations. In the modern concept, it involves training and supervision, for, as the old German proverb has it, "no master ever fell from Heaven."

#### PEOPLE, TRAINING AND SUPERVISION

So we devote the whole morning to people, training and supervising people, getting people to work together intelligently and effectively. We have two experts who gained their apprenticeship in industry and then developed means of expanding this knowledge and experience to help hundreds of others.

Don Scott and Lou Backer of Don Scott Associates show us the *what and how* of people development. Here surely is at last a practical what-to and how-to set of formulas which you can take home with you and put to use immediately in developing your own marketing people.

You can establish how you spot weaknesses—non-productive employees, confusion, politics, duplication, low morale, but it took Mel Wierenga (vice president, Ortho Division, California Chemical Company) to tell us how a company can avoid them—and how you go about it systematically to correct the situation. (This will be covered in a moment.)

Of course job descriptions are essential, yet survey after survey shows that very few companies have actual job descriptions for even all key jobs: a clear statement of what you want to do, and clear statement of what each man is to do in getting the total job done. And, as so many successful companies have found out, good performance starts with good selection.

It is axiomatic in organization that we don't hire people until and unless we need them. When we organize, however, we establish relationships of work, people and work place. And our greatest tool for proper relationship assignment is the job description.

A good job description predetermines what you want a man to do to accomplish your goal. It is the best way to eliminate subjectivity from job performance. But the job description goes much further—it is the objective of the specific job *and* it gives us a standard of performance for the job. Predetermined goals, delegation of authority and responsibility—au-

FARM CHEMICALS



## One bag shattered . . . the other has two-way stretch

The *unbroken* bag is made of H&W's new high-strength Expanda-Kraft.

As the lift truck braked to a sudden stop, both bags flew through the air and fell hard against the concrete floor. The regular kraft bag split open — note the spilled flour. Yet, look closely at Expanda-Kraft. *Not a sign of breakage!* Naturally, both bags were identical in basis weight and number of plies.

Expanda-Kraft is stronger, because it's made by a special roll-crepe process. It's resilient, has two-way stretch that soaks up shock. Available in white, semi-bleached and natural.

Expanda-Kraft comes in 40, 50, 60, 70, 80 and 100-pound basis weights. *For samples and information*, write Hollingsworth & Whitney, Division of Scott Paper Company, Chester, Pennsylvania.

# EXPANDA-KRAFT®

**HOLLINGSWORTH & WHITNEY** DIVISION OF  
 **SCOTT PAPER COMPANY**

## MARKETING

### FARM CHEMICALS Marketing PATTERNS

(Continued)

thority is the determining level—authority rises or lowers with the responsibility assigned.

In short, what we do is to break down the work load into units of 1. You assign responsibility and authority. And you establish accountability.

*The more you delegate, the further down you place decision making, the better the performance and the higher the morale, because that's where the facts are available.*

#### OBJECTIVE—PROBLEM . . . OBJECTIVE—PROBLEM

Spell it out, detail the job, and delegate responsibility and authority—once we establish our objectives. Once you establish your objective, you simply define your *problem*—but make sure you know specifically what the problem is. Then you find that you have a new set of objectives—and hence new problems—and you define those and then set new objectives. This has been the greatest advance in management know-how, and we are on the threshold of great new advances in management know-how.

People who know what they are looking for, who know how to find it and how to let prospective employees know what their respective job is, know how to appraise and motivate to get the job done well.

*Now to motivate people*—that is, the securing of willful and intelligent cooperation and action. For this management has two specific tools—clear thinking and communications. Just how difficult it is to communicate was shown in a unique demonstration—the result of one-way communication. And if in addition we have an emotional upset, you further complicate communications.

#### Good communication involves 4 things:

- (1) What I want to say to you.
- (2) What I *do* say.
- (3) What you think I said.
- (4) What you *want* to hear.

The most important is (3)—*what you think I said*—and people often think you say what they really want to hear. Yet accomplishment depends upon clear communication!

Much depends upon *leadership*—the ability to select the technique of motivation most appropriate to the particular situation. We all need money (economic need); we all have to satisfy our ego—(psychological need); and we all want to belong—(we have a sociological need).

Our specific method of getting this job done is by developing and training people. Before we can develop and train people we need three *specifics*:

(1) *There must be desire* on the part of the trainee—desire to improve.

(2) *He must acquire knowledge*—where he learns WHAT.

(3) *He must acquire experience*—finding out how to apply that knowledge acquired. Most of the development occurs on the job—about 90% is therefore experience.

Training and development is a continuous process to improve performance and productivity. We cannot accomplish our objectives unless we can get good performance from our people. And for all this we need to appraise or measure performance—against standards which have been pre-set, completely understood between supervisor and performer—and all this ties up with *job description*—set through 2-way communications.

From this we set our key results expected—our objectives—again through 2-way objectives. And then we appraise—that is, analyze the success and the failures, plus the development interview, face to face. But let the employee appraise what happened in his own way. From then on you can work out a development plan and put it into action.

#### ORTHO DIVISION USES SELECTION SYSTEM

Mel Wierenga then shows us how a company goes about building an organization around people, what management has to look for and look out for and just how useful job description becomes. He says that in actually doing the job, you often don't do what the book says you should do.

*Job descriptions are tools for management: they have to be used correctly, if they are to tell you exactly what it is that you are looking for and what kind of people you need to fill those jobs. Various tests are available to management to make the proper selection—and at Ortho they know what they are looking for. But they use a complete selection system—patterned interviews, tests, etc.*

Finding them is only the start. Now we follow Omar Khayyam's advice and "mold them nearer to our heart's desire." That means training. But it means careful selection too. We need to find the best qualified people to fill those job descriptions with the will and the intelligence to do the job, and then train them to follow our predetermined paths, our policies, our type of organization. The relationships of one group to another are important considerations—and at Ortho they center this on the district manager—all of them promoted from within, a policy which does not always work.

As always, management must perform the job of measuring results. At Ortho, they use an annual appraisal and supervisory checklist. Standards become most important: but at Ortho they are concerned with more than performance. How do you set standards? What, indeed, does a standard mean? And when we have these standards, how do we appraise performance against them? Not all jobs can be easily measured in terms of quantitative output, and we can never forget we are dealing with people. You really measure performance against the goals set.

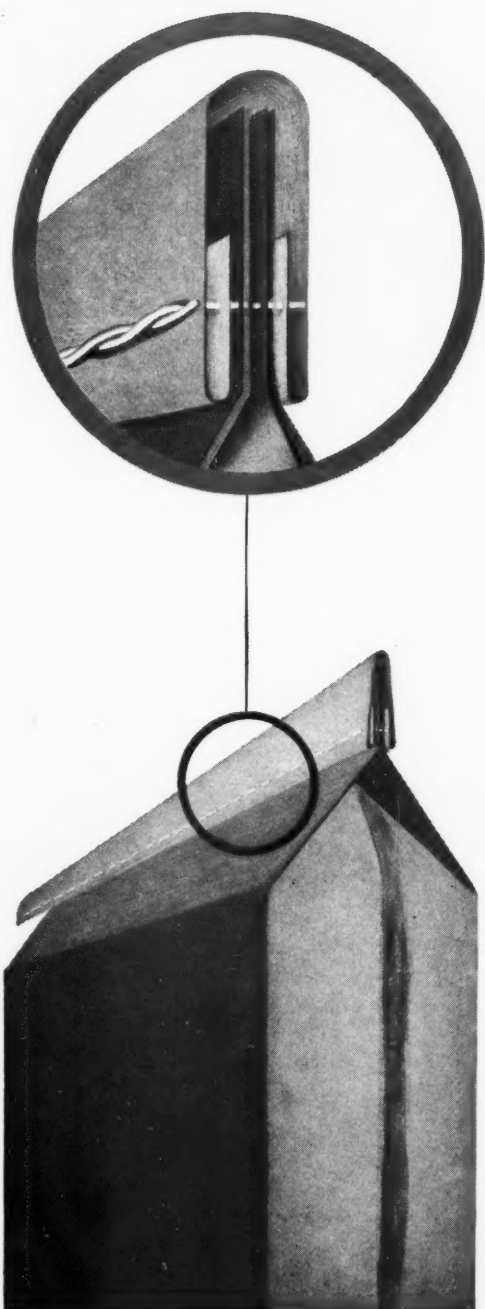
*Marketing includes, as we all know, critical jobs which have to be performed, but for which we have as yet found no standards of measurement: marketing research, planning, organization, training, indeed, almost every job that is not strictly measurable in terms of input and output.*

So, see you next year when we open the door and see what's behind that door on the marketing counter for 1962!

ANOTHER TECHNICAL ADVANCE FROM WEST VIRGINIA

# NEW **ImpactTAPE**<sup>TM</sup>

## DRASTICALLY REDUCES SEWN-END BAG FAILURE



Pioneer in the development of Clupak\* extensible paper, West Virginia now leads the way to a far stronger, tighter, money-saving sewn multiwall through "ImpactTape."

ImpactTape is a revolutionary new type of sewn tape closure\*\* that adds four layers of tape to the sewn end instead of the conventional two. This provides 49% greater toughness than standard sewn 70-lb. tape closures plus a new "cushioning" against impact shock.

### PROOF from actual field trial

A leading cement company had an unusually high sewn valve breakage rate of 1%. They packed a trial shipment of bags, using West Virginia's new ImpactTape. Average breakage rate went down to .3%—a reduction of 70%. Dollar savings from reduced breakage will far exceed the small upcharge for the new closure.

### PROOF from new testing technique

The development of ImpactTape was hastened by West Virginia's successful adoption of the Impact Resistance Tester to measure sewn end toughness under conditions of sudden shock. It represents the only sewn closure test devised thus far which bears a predictable correlation to drop tests and actual field performance.

Studies indicate that 70% of sewn bag breakage ordinarily is at the sewn closure, even on Clupak paper bags, because the sewn closure is the weakest point in the bag. Often this breakage was incorrectly blamed on the paper. Now stronger ImpactTape opens the door to profits from the greater toughness and possible basis weight reductions which Clupak paper is delivering to thousands of users. *This is realistic research achievement—aimed straight at reducing your total packaging costs.*

For a brochure giving detailed information, write and tell us whether you use sewn open mouth or sewn valve bags. Multi-wall Bag Division, West Virginia Pulp and Paper Company, 230 Park Ave., New York 17, N. Y.

\*Clupak, Inc.'s trademark for extensible paper manufactured under its authority and satisfying its specifications.

\*\*Patent Pending.



**West Virginia  
Pulp and Paper**



Wheless



Engibous

## NEW DEVELOPMENTS IN PHOSPHATES

*was first day's topic at Fertilizer Industry Round Table. New processes, interesting panels featured as 400 company representatives gathered to discuss old and new problems.*



Weber



Batson



Giles



Jacob



Markey



At podium is Rodger Smith, Eastern States, with H. L. Marshall, Olin Mathieson.



D. Walstadt, American Cyanamid; R. L. Jones, E. Carnell, Davison; T. Pierce, Swift; W. W. Harwood, Int. Min. & Chem.; H. P. Tatum, U. S. Phosphoric, is at podium.

Around table are D. Warren, Omega Machine, Div. of B-I-F; W. Law, Minneapolis-Honeywell; W. Strauss, Foxboro; A. Simmons, Fischer and Porter.

**P**HOSPHATES and their applications in the fertilizer industry and a continuation of the panel which proved so popular last year—preneutralization—were the subjects of the Fertilizer Industry Round Table conducted in Washington, D. C. November 2-4. Almost 400 people attended the tenth annual event.

Leading off the first day's discussion was Dr. James Engibous, International Minerals & Chemical Corp., whose topic was the present and future status of phosphate rock. The paper had been prepared by I. M. LeBaron of that company, but he was unable to be present. Engibous presented an interesting description of the well-known Florida phosphate industry, making good use of illustrations.

H. Wheless, Davison Chemical Company, in discussing continuous superphosphate production, told the group about their experiences at Davison's Curtis Bay works in Baltimore. Beginning superphosphate production in the second decade of this century before this country's entry into the first World War, Davison abandoned the original batch process 40 years later in favor of a modern continuous process, he said.

"Faced with the higher and higher costs of operating and maintaining the six mixers on the three mixer platforms, three rasps or disintegrators and the heavily scheduled bridge cranes, Davison elected to install a modern efficient continuous manufacturing process," Wheless explained.

### DAVISON'S SUPER-FLO PROCESS

The first construction work was begun in January 1959 by the A. J. Sackett and Sons of Baltimore, and their new Super-Flo process produced its first superphosphate about three months later.

Here's the way he described their process:

Davison's Super-Flo process was designed to tie into the existing ground rock storage bunkers' acid supply and fume removal system. Screw conveyors which formerly supplied ground rock to any of six locations for the batch process were modified to deliver the ground rock to a single downspout. The over-all length of these suspended bunkers which span three huge crane bays is some 225 feet.

The downspout discharges the ground rock into one of the old superphosphate dens which was incorporated into the ground rock handling system to provide a surge and overflow pit and to increase storage from some 480 tons to about 800 tons, thus permitting flexibility between rock grinding and acidulation schedules.

An 80-ton per hour capacity elevator in a steel elevator shaft in one corner of the old den picks up the ground rock and discharges it into a constant head



rock hopper, the overflow from which is returned to the surge pit.

By elevating a surplus of rock and returning the excess to the surge pit the scale feed hopper maintains a constant head of fully aerated dust, thus eliminating one of the variables which tend to impair accuracy or precision in a continuous ground rock weighing system.

A variable speed screw feeder supplies the rock to a weigh feeder belt, the rate on which is controlled and indicated in the control room.

Wheless said that should the rock feed rate increase or decrease, the feed screw is automatically decreased or increased accordingly so that the rock feed to the cone is constant for any given setting.

The belt feeder discharges the rock into a funnel which in turn discharges into a TVA-type mixing cone.

Sulfuric acid at a concentration of some 57° to 58° baume and at a temperature of approximately 90° F, controlled by indirect heat exchangers, is supplied to an indicating-controlling magnetic flowmeter at some 25 to 30 pounds pressure and precisely metered to the mixing cone through a four-nozzled ring manifold. The mixing cone is also equipped with water nozzles for further dilution of the acid if necessary.

At its design production rate of 90 tons of superphosphate per hour, the process consumes about 33 tons of acid per hour basis 100%  $H_2SO_4$  or over 100 gallons per minute at 90°F–58° baume, added Wheless.

"Some 18 months of experience have shown us that most of the savings and other benefits we had hoped for in our modernization have actually been achieved," Wheless concluded.

Types, sources and characteristics of phosphoric acid was the topic of W. Weber, Dorr-Oliver. This was followed by a discussion of its usage in mixed fertilizer by Mel Leach, Indiana Farm Bureau, and Rodger Smith, Eastern States.

F. M. Batson, General Chemical Division, discussed phosphoric acid handling and storage. In recent years the dry fertilizer industry has started to use phosphoric acid for granulation, and the liquid fertilizer manufacturers are using wet process acid increasingly in various liquid formulations. With this increased usage, some new types of equipment for handling the acid came into being.

Problems initially experienced in handling the acid have been largely overcome as acid manufacturers improve their product and the fertilizer manufacturers improve their techniques, he said.

The storage most commonly used with phosphoric acid and the one that will give the best overall service at reasonable cost, is the rubber-lined steel tank. A storage of this type will cost on the order of \$0.40 to \$0.50 per gallon, plus installation costs. It should last twenty years or more, he said.

Another type which Batson described consisted of a plastic bag inserted as a loose liner in a steel or a wooden tank. Although this combination of materials is less expensive than a rubber-lined tank, it may be less durable.

He concluded his discussion on storage with a description of the pool-type tank. This, he said, offers a large volume storage at a low cost, about \$0.05 to \$0.10 per gallon. This type can be built on top of the

ground by moving in earth to form its walls, or it can be partially built below ground level. The interior of storage is lined with an acid resistant material, and a roof built to keep out rain and dust.

One type of lining material that has been used consists of several layers of asphalt and burlap, on a base of heavy screening. Since experience with pool-types is still somewhat limited they should be regarded as a secondary type of storage to back up such primary storage as the rubber-lined tanks.

In discussing pipes, pumps and valves, Batson said that the most commonly used, very serviceable and of relatively low cost for rigid pipe lines is unplasticized PVC. Rubber-lined steel gives good service, but is more expensive.

Several types of valves have been used in phosphoric acid service. The most commonly used is the Saunders Patent diaphragm valve, with a steel or a PVC body.

For pumping phosphoric acid the common practice is to use a centrifugal pump made of FA-20 alloy or type 316 stainless steel. The extra cost of the FA-20 alloy pump is more than justified by its longer service.

As is generally known, wet process phosphoric acid tends to drop put solids on standing, and this in time causes a build-up of precipitate in the acid storage. This has generally been more of a nuisance than a problem. The usual course of action is to do nothing about this until it becomes convenient or necessary to clean the storage, usually about every year or two. The question has sometimes come up concerning agitating the storage, thus keeping the solids in suspension and removing them along with the acid. This is not particularly practical. It would conceivably work if the acid were agitated continually, seven days a week. If agitation is interrupted, the solids will settle and will probably not resuspend, added Batson.

#### **PANEL DISCUSSES BEHAVIOR OF TRIPLE**

Next came a panel discussion on the behavior of triple superphosphate in mixed fertilizer formulation. First speaker was Frank Niellson, International Minerals & Chemical Corp.

Niellson stated that there has been a whopping 1860% increase in the use of triple superphosphate over the past 20 years.

Joe Markey, Tennessee Corp., also referred to the tremendous revolution in the fertilizer industry. In many cases, he said, it has caused "near panic" in the industry. He said that there is no one answer as to where we are going.

"Each of you knowing the facts, being in an informed position, can make the best decision for your own particular situation," he said.

Charles Franklin, IMC, discussed efficiency in formulating triple. He said that particle size greatly affects ammoniation rate of triple. In discussing temperature, he said that high temperature increases the plasticity of fertilizer thus reducing ammoniating efficiency. Best results are obtained between 140–150 degrees, he said. Efficiency is lowered when temperatures exceed 200 degrees.

American Cyanamid's Don Walstadt told the group that poor granulation can be compensated by good

## PRODUCTION METHODS

### NEW DEVELOPMENTS IN PHOSPHATES (Continued)

formulation techniques, "but poor porosity cannot be compensated." He added that the type of sparger used will affect the rotation speed of the drum.

A. B. Phillips, Tennessee Corp., discussed a new process in production of granular diammonium phosphate in the ammoniator-granulator. He said that the process appears to have a number of desirable features, including the following: (1) either electric-furnace or wet-process phosphoric acid can be used and the process is adaptable to acids of concentrations as low as 32 to 34 per cent  $P_2O_5$ , (2) the recycle rates required are lower than in many other granulation processes, (3) the heat of chemical reaction is utilized in the evaporation of water to the extent that drying may not be required, (4) the product granules have very good physical properties, and (5) the equipment required is of conventional type.

Phillips said that a 21-53-0 and an 18-46-0 grade had been made with electric furnace acid.

Clem B. Giles of California Chemical Co., Richmond, California described their nitric-phosphate production and the Spheroidizer process.

"Our company entered the fertilizer manufacturing business in 1956 with the installation of a complex fertilizer plant at Richmond, alongside the Richmond Refinery of the Standard Oil Company of California," he explained.

An ammonia plant and a nitric acid plant were built as part of the refinery complex and ammonia and nitric acid were piped to the fertilizer plant adjacent to the refinery, he added.

Giles explained that the major unit in the fertilizer plant was the complex fertilizer plant of the PEC (Potasse et Engrais Chimiques) process. He said the process was chosen after conducting extensive agronomical testing in California and other Western states to determine the suitability of using the citrite soluble  $P_2O_5$ . These agronomical tests were extremely successful, Giles explained, and it was decided on the basis of these tests to proceed with the construction of the PEC complex plant.

#### PEC REACTOR SYSTEM EXPLAINED

Giles said that the system consists of three basic stages: (1) acidulation, (2) ammoniation, (3) addition of potash (although this is not necessarily part of the PEC system).

"In the acidulation stage, which can be performed in one, two or three reactors depending on the rate and the retention time required by the rock, the phosphate rock is fed into the reactor," Giles explained.

"All the reactors in the PEC system are the same, which is one of the advantages of the system inasmuch as whenever you want to increase production it is necessary only to add more reactors to the train, since they are all the same.

"The nitric acid acidulates the phosphate rock, making the  $P_2O_5$  available in the dicalcium form which is the citrite soluble  $P_2O_5$ . Also produced is

calcium nitrate, which if left in the product would produce a highly hygroscopic salt which could not be stored in bulk. Therefore, the calcium nitrate has to be either removed or converted."

Giles said the Chemical and Industrial Corp. had been working on the development of a Spheroidizer between the time they built the Richmond plant and when they built the Kennewick plant. He said they had visualized that a step could be saved if the drying and granulating of complex fertilizer could be handled in one stage. They set up a pilot plant operation in Cincinnati to determine if this were possible, and after experimentation were able to operate the pilot plant satisfactorily and produce the spherical pellets which they had hoped to.

The first plant was installed by C&I at Western Phosphates plant in Garfield to produce ammophos fertilizer. The next plant to go into operation was the one at Kennewick, although this was followed very closely by a plant at Cuba.

"We wanted to take advantage of the simple drying and granulating step to avoid as much as possible conveyors and elevators within the plant. In so doing we were able to cut down the size of the complex plant for producing basically the same rate from a plant approximately 150 feet by 150 feet to one 80 feet by 80 feet," Giles said.

They were also able to cut down the number of elevators and conveyors and reduce very appreciably the amount of fines recycle required. Thus, they were able to eliminate the large crushers required at Richmond to produce the fines required for granulation.

#### HERE'S THE PROCESS

Basically, the PEC reactors produce slurry which drops into a tank after having had potash added to it in a mixer at the end of the reactor train. The slurry is then pumped from this tank, which is maintained agitated, to the nozzles of the Spheroidizer and sprayed onto a dense curtain of falling recycled pellets.

The Spheroidizing is performed at the first section of the drum and the majority of the drum is used for diffusion drying. The outlet from the Spheroidizer is then taken by an elevator to a screen where the oversize is returned to a crusher in circuit with the Spheroidizer, the product is coated and taken to the warehouse and the fines also fed back to the Spheroidizer.

Giles emphasized that the fines bin was considered necessary during the design stage but after operation it was felt that this fines bin could very well be bypassed. As a result, he said, the operation simplified and that's how they are operating the Kennewick plant.

As usual, K. D. Jacob of the USDA contributed some worthwhile information to the Round Table. In discussing the developments in phosphates he presented some excellent graphs and tables on production of phosphorus fertilizer materials in the U. S.

This concluded the first day's program.

Standardization of raw materials became the topic of the morning session of the second day, followed by instrumentation problems, and preneutralization. Highlights of these sessions will be covered in the next issue. ▲

# READER SERVICE

*FREE INFORMATION to help you  
solve fertilizer, pesticide problems*

## Chemicals

### 366—GRANULAR ATTAOLAY

Minerals and Chemicals Philipp Corp. has technical information on Granular Attaolay, a granular carrier for pesticides and herbicides. Mesh sizes, absorbency and release and flow properties are controlled. Just

CIRCLE 366 ON SERVICE CARD

### 367—FERTOMASKS

Dodge and Olcott, Inc. has designed a new series of fragrances which it has named "Fertomasks." By adding Fertomasks to fertilizer, unpleasant odors fade. It is intended for use primarily with garden and shrubbery fertilizer. For literature

CIRCLE 367 ON SERVICE CARD

### 368—SPENCER REPORTS

Manufacturers may secure reports on experiments which Spencer Chemical Co. has made with ammoniating solutions. Experiments are being run on processing a variety of raw materials into grades, nitrogen uses and others. To learn more

CIRCLE 368 ON SERVICE CARD

## Process Equipment

### 369—PELLETIZING AND MIXING DISCS

A 4-page bulletin describing the company's standard line of rotating discs for pelletizing such materials as ore fines, phosphates, ceramic clays, fly ash and oxides has been published by Dravo Corp. "Dravo Pelletizing and Mixing Discs" cites design features of discs which range in diameter from 39" to 16 feet, 5" and lists typical capacities. Dravo's rental plan is also noted. Just

CIRCLE 369 ON SERVICE CARD

### 370—PRE-ENGINEERED DRY FEEDERS

A new series of pre-engineered dry feeders are now available from Tower Iron Works. Designed primarily for uniform flow of pulverized, powder or granular dry materials in the chemical, plastic, ceramics, food products, fertilizer or industrial minerals fields, these dry feeders feature reinforced machined casings, corrosion resistant linings and a channel base which takes the motor load off the feeder casing. Additional data are available if you

CIRCLE 370 ON SERVICE CARD

### 371—FURNACE FUME

"In a Fog About Electric Furnace Fume?" is the title of a new bulletin offered by Wheelabrator Corp., which discusses

the three accepted hooding methods for controlling fume from electric arc melting furnaces—furnace roof type, over-head canopy hooding and direct shell evacuation. Described in detail in this 8-page brochure are the operating principles and advantages of each system. Illustrations of typical installations and diagrams are included. Just

CIRCLE 371 ON SERVICE CARD

### 372—ALARM ROTAMETERS

A new line of alarm rotameters made by the Instrument Div., Schutte and Koerting Co. is designed to measure fluid rate of flow and to indicate abnormal high or low flows. They can be made to activate a warning light or alarm device and will start or stop a pump, motor or control unit. Each unit contains a magnet and a hermetically sealed reed type alarm switch. A bulletin may be obtained by

CIRCLING 372 ON SERVICE CARD

### 373—DESPATCH HEATERS

A new line of heaters for do-it-yourself applications in the chemical and other industries has been announced by Despatch Oven Co. For use in curing, aging, dehydrating, the heaters employ gas, oil or electricity and are rated from 150 thousand to 3 million btu and 8 to 360 kw. Heaters are available singly for custom-engineered applications or can be had in complete packaged systems. For complete data

CIRCLE 373 ON SERVICE CARD

### 374—RELIEF VALVE

A sensitive diaphragm relief valve for service where corrosive chemicals are a problem is manufactured by Farris Engineering Corp. The valve provides a vapor-tight seal to prevent leakage and eliminate waste, and the springs and guides are isolated from the process fluid. It can be used with chemicals, slurries, other liquids and gases, and is especially suited to nitrogen and other light gas service. A catalog may be secured by

CIRCLING 374 ON SERVICE CARD

### 375—MEMORANDUM FROM MONITOR

Technical Memorandum No. 1, "Statistical Data Reduction and Control

Systems," is available from Monitor Systems, Inc. It discusses methods for increasing efficiency of data reduction and automation systems for quality control, continuous processing and large-scale experimental work. For free copy

CIRCLE 375 ON SERVICE CARD

### 376—SCHNEIBLE SCRUBBERS

Claude B. Schneible Co. has a complete technical data booklet on its multi-wash scrubbers. They have no moving parts and no spray nozzles. They may be located anywhere outside or inside a building. Scrubbers can be used for fertilizers, explosives, pharmaceuticals and other substances. To get your literature

CIRCLE 376 ON SERVICE CARD

## Materials Handling

### 377—BULK CONVEYORS

Chantland Manufacturing Co. has a catalog which describes all machines in its Elton Line. Dual purpose bulk conveyors can be used for sacks or for fertilizer, sand, gravel, grain. To get this catalog, just

CIRCLE 377 ON SERVICE CARD

### 378—PALLET DIGEST

A digest-size booklet describing pallets and their uses has been published by the Raymond Corp. Titled "ABC of Pallet Handling," the booklet lists advantages of wood and metal pallets and explains specifications. It also describes how to estimate pallet requirements by floor-area, weight and unit methods. For your copy of the handbook

CIRCLE 378 ON SERVICE CARD

### 379—PAYLOADER LITERATURE

The Frank G. Hough Co. will send you literature on its Payloader models. The "H2-5" has a one-ton-per-minute capacity, power steering and power shift transmission. Larger models have 12,000 pound operating capacity. To get this literature

CIRCLE 379 ON SERVICE CARD

### 380—MOBILE BLENDER

New Leader mobile blender is manufactured by Highway Equipment Co. which is offering free literature. The blender mixes and spreads three fertilizers at once, has twin spinners and 36" conveyor. For your literature

CIRCLE 380 ON SERVICE CARD

### 381—BROCHURE ON PALLETLESS HANDLING

Questions concerning palletless handling are discussed in an 8-page, 2-color brochure

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- Print or type your name, position, company and address
- Clip and mail the Service Card

**See pages 55 and 56 for information  
on these Reader Service numbers:**

398—Easiflo Packers

400—Straight Centrifugal Pumps

399—Seamless Plastic Coating

401—Tite Seal Headgear

402—Yale Fork Lift Truck

published by Automatic Transportation Co. Pros and cons of both methods are listed, and five pages of action photographs are included. For your free copy

CIRCLE 381 ON SERVICE CARD

### 382—VARIABLE SPEED DRIVES

"Type RS P. I. V. Variable Speed Drives" is the title of Link-Belt Co.'s new 6-page Folder 2874, which describes the firm's HP variable speed drives. They are designed to meet capacity demands up to 50 HP and ratios up to 5.5:1. Stepless speed adjustments between maximum and minimum settings are achieved by a twin-strand, single roll chain that operates between a pair of smooth facing wheels. Get your folder by

CIRCLING 382 ON SERVICE CARD

## Packaging

### 383—EXPANDA KRAFT

Information is available from Scott Paper Co. concerning Expanda Kraft, its new two-way stretch paper. It is resilient, made by roll-crepe process and comes in white, semi-bleached and natural. Be sure to

CIRCLE 383 ON SERVICE CARD

### 384—INTERMEDIATE CHECKWEIGHER

Toledo Scale Corp.'s new Model 9463 intermediate checkweigher is intended for items from 2 to 25 pounds at a speed of 60 packages per minute. Maximum package size is 12" long by 12" wide. Maximum height depends upon package stability. Zone edge tolerance is plus or minus 1/4 ounce. To get literature on the new scale

CIRCLE 384 ON SERVICE CARD

### 385—FISCHBEIN CATALOG FILE

Dave Fischbein Co. is offering a complete catalog file on the company's bag closing equipment. Included are: automatic Model BA-6 which sews bag and cuts thread automatically; tape binding attachment which is completely portable and the bag closer Model C which can close an average 100-pound bag in less than 6 seconds. For your catalog file

CIRCLE 385 ON SERVICE CARD

### 386—CHECK-WEIGHING SYSTEMS

A new brochure on check-weighing systems has been published by Weighing and Controls, Inc. The systems covered can be applied to all types of dry or liquid, single- or multi-unit containers to provide a continuous check on the filling accuracy

of packaging equipment. A 4-page booklet illustrated with photographs of components and block diagrams of typical systems is available to readers. Please

CIRCLE 386 ON SERVICE CARD

## Application Equipment

### 387—FLOW REGULATOR

Delavan Manufacturing Co. has introduced a new flow regulator to its 1961 line of agricultural spray equipment. The regulator will be available in orifice sizes from .014" to .250". It will be offered in 1/8" and 1/4" pipe thread inlets and also 1/4", 3/8" and 1/2" hose barb connections. Catalog 2-1-8 gives full information, which you may have by

CIRCLING 387 ON SERVICE CARD

### 388—OPEN CART SPRAYER

An open-top cart sprayer, made by D. B. Smith and Co., has balloon tire wheels, air gauge, trigger control and adjustable nozzle. It can be used for weed and brush killer, insecticides on plants or animals and fighting fires. For more information

CIRCLE 388 ON SERVICE CARD

### 389—PITZER LINE CATALOG

Squibb Taylor, Inc. is offering a catalog showing its complete Pitzer line of valves and fittings for anhydrous ammonia. It includes the following types of valves: filler, shut-off, vapor, relief, outage, stop fill and bleed. Couplers and adapters are also available. To get your catalog of the Pitzer line, please

CIRCLE 389 ON SERVICE CARD

### 390—AERIAL APPLYING EQUIPMENT CATALOG

Transland Aircraft Div., Hi-Shear Corp. has recently issued a new aerial applying equipment catalog, covering the firm's Swathmaster equipment, Transland hoppers, pilot controls, liquid systems, dry spreaders and fire dump grates. It also gives information on how to order, and a crash protection policy. A catalog will be sent to you, if you

CIRCLE 390 ON SERVICE CARD

### 391—METERING PUMP

Heavy-duty construction of John Blue's "And-y" metering pump features dust-tight crankcase, ball bearing crankshaft, large capacity heat exchanger and precision stroke adjustment. The pump applies up to 140 pounds of NH<sub>3</sub> per acre

on swath of five 40-inch rows. It has etched aluminum quantity scale and high output roller chain drive. More facts on this pump may be secured by

CIRCLING 391 ON SERVICE CARD

## Miscellaneous

### 392—TANK CLEANER

Bulletin 444, from Sellers Injector Corp., describes the company's new heavy-duty Model "H" tank cleaner. This is a lightweight, water-driven unit. Photographs show dimensions of the unit and its working positions: on a collapsible stand or suspended from the end of a supply hose. Specifications such as liquid measures, total capacity in gallons per hour and nozzle revolutions per minute are listed tabularly. Copies of the bulletin are available by

CIRCLING 392 ON SERVICE CARD

### 393—LABORATORY BALANCES

High capacity (up to 6 kilograms), high sensitivity (0.1 grams), and a sturdy all-aluminum case are the features of a new line of multi-purpose laboratory balances from Henry Troemner. Two models are offered, both with stainless steel pans or plates and a tare beam for simplifying measurement of net contents. For complete specifications and measurements

CIRCLE 393 ON SERVICE CARD

### 394—CUSHION COUPLINGS

Two new types of Para-flex, flexible cushion couplings are described in a 20-page booklet by Dodge Manufacturing Co. Complete engineering data, photographs, dimension drawings and selection tables cover the couplings. Bulletin 901 will be sent to you if you

CIRCLE 394 ON SERVICE CARD

### 395—TUBING BULLETIN

Tubing for all types of gas chromatography columns—capillary, miniature and packed—has been announced by Superior Tube Co. The tubing combines corrosion resistance with ability to withstand high processing temperatures and heat transfer properties. It has a smooth inside diameter surface which will receive a variety of coatings. For a bulletin

CIRCLE 395 ON SERVICE CARD

### 396—ADVERTISING MAT BROCHURE

Toot your own horn is the theme of a new advertising mat brochure offered by The F. E. Myers and Bro. Co. It includes a listing of suggested layouts and possible sources of advertising that can be used to further sales and profits. The brochure is available by

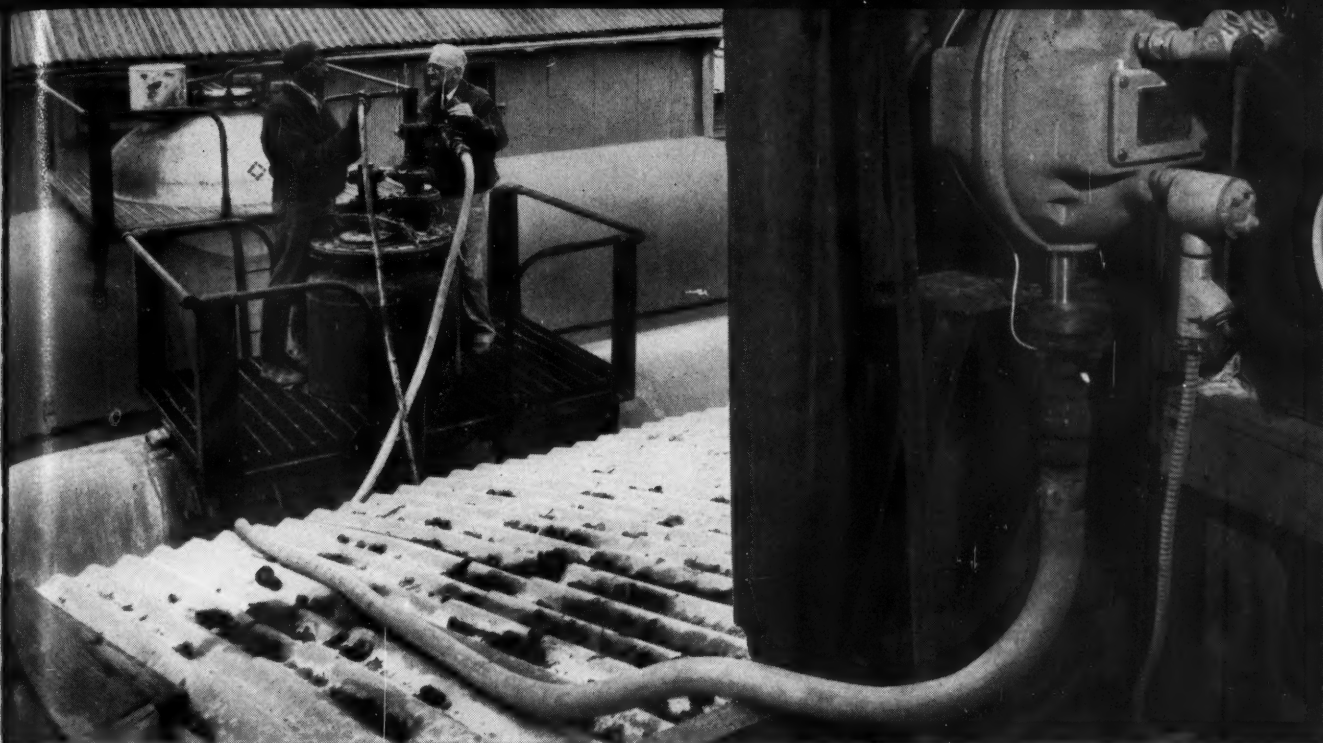
CIRCLING 396 ON SERVICE CARD

### 397—SOIL TEST OUTFITS

Two new catalogs on Simplex soil test outfits have been prepared by The Edwards Laboratory. One catalog describes and illustrates the Simplex Complete, Junior and Farm soil test outfits and Soiltex, and the other lists 10 accessories.

CIRCLE 397 ON SERVICE CARD

FARM CHEMICALS



*Cyanamid technical representatives spend thousands of hours every year in our customers' plants working on problems like this one: installation of a meter for measuring phosphoric acid as it is pumped from tank cars.*

## HIS BUSINESS IS MAKING YOUR BUSINESS BETTER

*Like all the men and women in Cyanamid's phosphate operation,  
his only business is phosphates for your mixed fertilizers*

He's one of several hundred Cyanamid people who mine, process, research, deliver and service phosphatic materials for your acidulation and mixed fertilizer business. These people put Cyanamid's more than 40 years of phosphate experience into the kind of products and services you can use. Take advantage of both. Pick up your phone and call your Cyanamid representative.

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**Traffic Service:** Cyanamid traffic specialists are ready to route and ship your orders without delays. Their knowledge can save you money and can make your oper-

ation run even more efficiently.

**Technical Service:** Cyanamid's staff of technical experts are on 24-hour alert. Often, what are new problems to you are solved problems to them. Make your formulation and production problems theirs. That's their job.

**Sales Service:** Cyanamid sales representatives are available to work with and for you in expanding present markets or in establishing new markets.

**Products that serve:** Cyanamid's only phosphate business is mining and manufacturing the highest quality products for your mixed fertilizer requirements.

- Florida Natural Phosphate Rock.

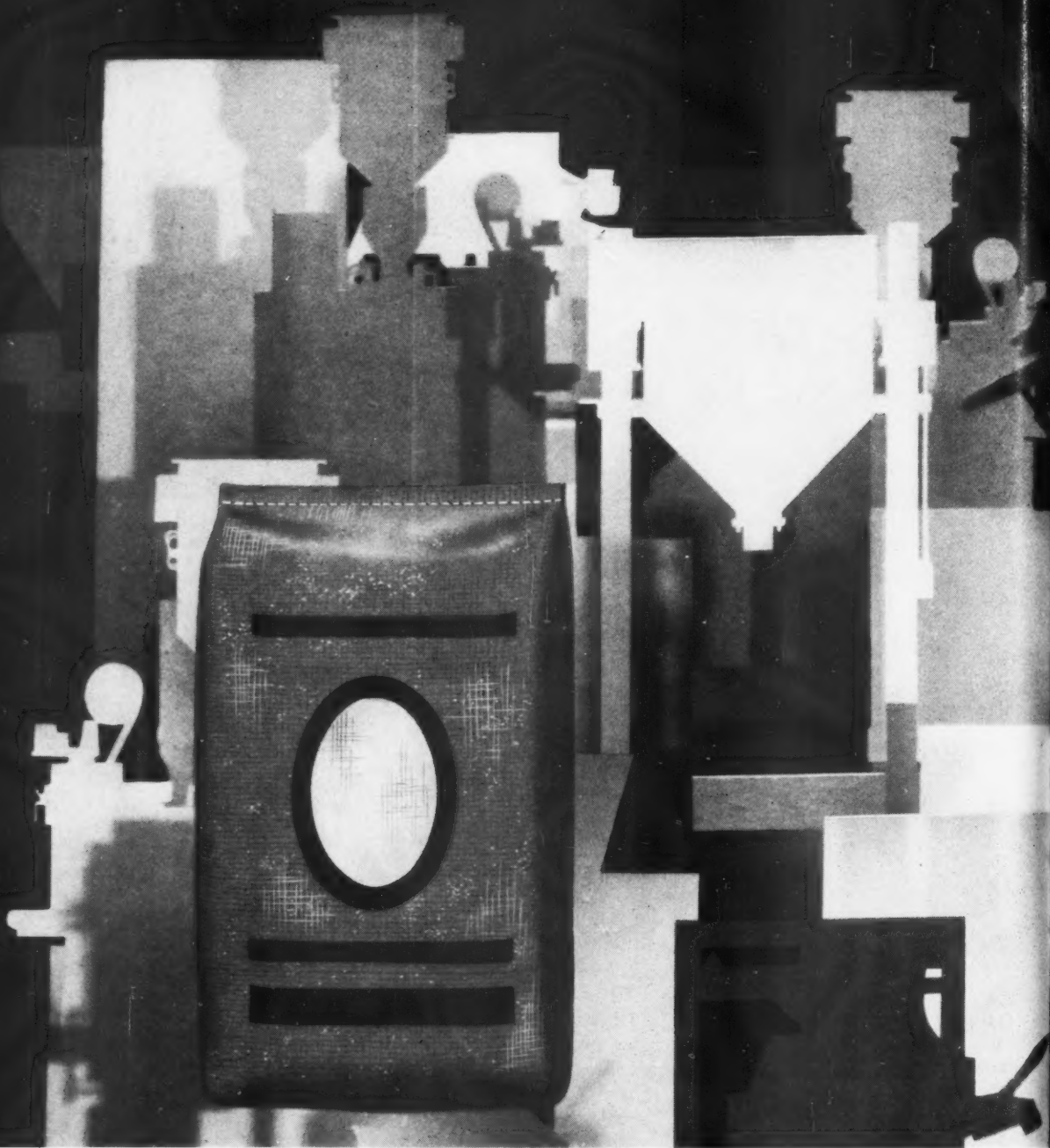
- TREBO-PHOS® — Triple Superphosphate.

- Phosphoric acid for acidulation. *To manufacture fertilizers that sell...mix with Cyanamid's phosphates and service.*

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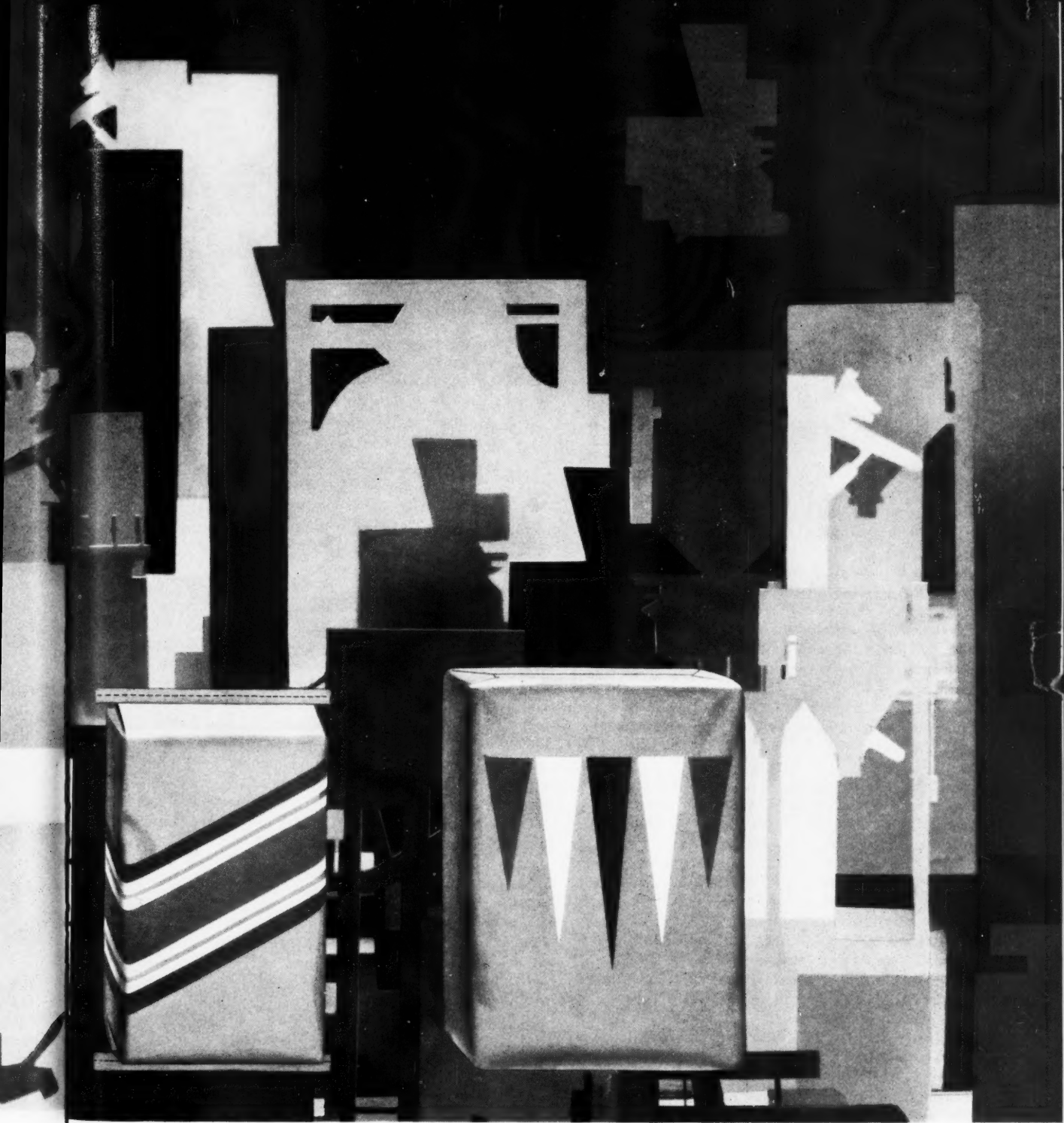
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PAPER COMPANY

# ARE YOUR PRICING POLICIES WITHIN THE LAW?

*Washington trends are toward closer governmental control on business practices.*

By PETER C. CROLIUS

*We have attempted to explain in general language the purposes, scope and application of the Robinson-Patman Act and to acquaint the businessman with the basic underlying principles of the Act and the implication of his practices.*

FARM CHEMICALS feels that it is time for chemical people to brush up on the law and to take stock to see if they are doing anything in violation of the Act and to take whatever corrective measures necessary.

Ralph L. Cherry, Washington Editor of the widely-read chemical weekly, Oil, Paint & Drug Reporter, indicated in a recent issue of that publication that "chemical people were all ears" as Trade Commissioner Earl Kintner made it clear that the Robinson-Patman Act is here to stay, and sellers had better get in line with the law.

The trends in Washington are all in the direction of closer government controls over business practices, and it is doubtful whether the last month's elections will change them.

IN 1914 CONGRESS passed the Clayton Act, a statute designed in large measure to prevent monopolistic practices in distribution.

The Robinson-Patman Act, which became law twenty-two years later, amended Section 2 of the Clayton Act. Intended to protect the small businessman—particularly the small distributor—the R-P Act is aimed at (1) preventing unscrupulous buyers from abusing their economic power by extracting favorable prices which are not granted to others less powerful, and (2) preventing unscrupulous suppliers from attempting to gain an unfair advantage over their competitors by discriminating among competing buyers.

Because of its broad scope, its ambiguous wording, and its complex interpretation and application, the R-P Act is certainly the most controversial antitrust statute affecting business.

There have been hundreds of books and articles written, and literally millions of words spoken and recorded on this law.

To say that it is controversial is really putting it mildly. Some people question whether the Act has produced its intended results. There is considerable dispute on what practical effects the law has produced.

In the broadest and non-technical sense, the R-P

Act covers any firm, individual, or association which buys or sells in an interstate market.

Again in the broadest sense and without being technical, the Act seeks to make equal treatment available to all sellers or buyers. That's it in a nutshell.

The Federal Trade Commission was set up in 1914 to enforce the Clayton Act, so it enforces the R-P Act too. FTC has recently stepped up its enforcement—and strengthened its enforcement machinery. Instead of bringing a complaint against one or two companies in a particular market or industry (which proved to little avail and in some cases harmful to business), FTC is now trying enforcement on an industry-wide basis. The upward trend in enforcement will definitely continue.

You're too small to come under coverage? Don't you believe it! Anyone coming under the above general rule of coverage is FTC's fair game. The cigarette, paperback book, tire, candy, and toy industries have had the lion's share of violative publicity these days—but FTC investigations and enforcement actions can and do cut across all businesses large and small.

The Robinson-Patman Act is a federal statute. And only when there is a federal violation (an interstate application) can FTC step in. However, twenty-six states have statutes in some ways similar to the R-P Act.

There are certain sales that are exempt. Sellers are free from the Act with respect to:

Sales to federal, state, or municipal governments.

Export sales.

Sales to schools, hospitals, churches, and charitable institutions which are not operated for profit.

Considerable latitude is allowed in disposing of seasonal, obsolescent or perishable goods. However, this is a defense which the seller must prove to justify the discriminating price cut or reduction.

The Robinson-Patman Act is divided into several categories of prohibitions, but, as noted earlier, the law basically says you have to give everyone a fair shake.

The ABC Fertilizer Company sells mixed fertilizer to W, X, Y, and Z, who are competitive distributors. W is far and away the largest buyer. Z is the smallest.

Can ABC drop its price of mixed fertilizer to W?

Yes, if ABC also drops its price the same amount to X, Y and Z. No, if ABC drops its price only to W. No, if ABC drops its price to W, X, and Y, but not to Z.

Charging a lower price to one customer but not to another, in the absence of one of defenses stated below, is clearly "price discrimination" and unlawful under the R-P Act.

Now suppose that the ABC Fertilizer Company had been selling only to X, Y and Z competitive distributors. Distributor W, who is competing with distributors X, Y and Z, is supplied by the DEF Fertilizer Company. ABC decides it wants to get some of the W business. Can ABC drop its price on mixed fertilizer to W without dropping it to the other three buyers?

Yes—but only if ABC drops its price to DEF's price *and* if the price reduction was made "in good faith to meet an equally low price of a competitor," in this case DEF's price.

Shouldn't ABC and DEF be allowed to drop prices to W only because W can take a larger quantity? In other words, shouldn't W be given a volume discount? Volume discounts are unlawful UNLESS the discount is justified by lower manufacturing costs or lower costs of selling or delivering, or the discount is a "good faith" meeting of a competitor's equally low price.

Of course, ABC or DEF may sell mixed fertilizer to their customers at reduced prices when the grade or quality of the material is so different as to justify the reduction.

But, the law says, they can't discriminate in price if such action results in substantially lessening competition, a tendency to create a monopoly, or to injure, destroy or prevent competition.

One section of the R-P Act deals exclusively with brokers and brokerage—particularly "dummy" or "bogus" brokerage wherein buyers secure price advantages.

A "bogus" broker is someone who doesn't perform the services commonly regarded (and interpreted) as broker's services. For example, a person in the employ of a buyer yet accepting a commission from a seller, is referred to as a "bogus" broker. Although the "bogus" broker (1) performs a valuable distributive service or (2) effects actual savings to the seller's distribution costs or (3) doesn't effect any adverse competitive situation: under the law this acceptance of compensation from the seller is considered a disguised discrimination.

#### CUSTOMERS PROPORTIONALLY EQUAL

Two portions of the Robinson-Patman Act concern themselves primarily with discriminations in the area of promotional allowances, services and facilities. Key phrase in this respect is *proportionally equal*. That is, a seller must treat his competing customers on proportionally equal terms when it comes to promotional allowances, services and facilities.

These include:

- 1) Advertising, payments or allowances.
- 2) Window and floor displays, demonstrators, display materials.
- 3) Warehousing facilities.
- 4) Accepting returned goods for credit.

As in the case of ABC's customers, W, X, Y and Z

were not all of the same size. Nevertheless, since the four buyers compete, ABC's promotional allowances must be proportioned on some basis or plan which is fair to all four. No single way to fairly proportionize is prescribed by the law. Various methods can be used.

*Example:* A seller may properly offer to pay a specified part, say 50%, of the cost of local newspaper advertising up to an amount equal to a set percentage of the dollar volume of customers' purchases during a specified time. However, a seller *may not* select one or a few customers to receive special allowances to promote his product because of the customer's special reputation. Neither can he provide an allowance on a basis of graduated rates depending on the amount of goods purchased. For instance, 1% of the first \$1,000 purchases per month, 2% of the second thousand and 3% of all over that. This would discriminate between larger and smaller customers.

#### WHAT ABOUT PROMOTION PLANS?

It is the seller's responsibility to inform all his competing customers that he has an advertising or promotional plan available. Whether or not competing customers take advantage of the plan is their business. But at least customers are assured of the opportunity to participate on a fair basis.

A seller can limit the area of his promotion to a single market area, unless the marketing areas overlap. For example, an equipment manufacturer who has four distributors in New England may limit promotional allowances to that region (not giving the same allowances to distributors in other areas). The manufacturer must give all four distributors proportionally equal treatment, and again, of course, he must be careful not to discriminate against competing customers in overlapping trade areas.

Bonuses or extras have to be watched closely. Arrangements like free installation, maintenance, free containers and long-term no-charge storage on a "just-for-you" basis are illegal.

To make sure a buyer is covered, the Act states: "It shall be unlawful for any person . . . knowingly to induce or receive a discrimination in price." A buyer is equally guilty with the seller if he either (1) knowingly induced or (2) knowingly received a discriminatory price concession.

All right—so you've violated the R-P Act. Now what happens?

Federal Trade Commission steps in (although in all probability FTC agents have been nosing around for weeks) and simply orders you to stop the practice. These stop-orders may appear mild at first glance. However, two factors come into play which compound the seriousness of your situation. One, FTC publicizes the facts, the situation and the violation. The reputation you've so carefully built up is questioned openly in the press. Two, it is going to cost you plenty to answer and bail you out of the FTC charge. As violations are repeated, "bad press" and attorneys' fees increase in proportion.

But you don't stop. Now you're in trouble. In the case of a continuing violation the fine can go as high as \$5,000 per day per violation.

Best way to keep out of trouble is to give or make available to all sellers, buyers and clients equal treatment in prices, advertising allowances, extras, and all business transactions. ▲

## MATERIALS HANDLING CUSTOM APPLICATION

Addressing association is Earl McNew of Nitrogen Div., Allied Chemical. Seated are Rhotin Cross, Farmers Elevator Co.; John Wilson, Sangamon Grace Ammonia Co.; Roswell Garst, Garst and Thomas Hybrid Corn Co., Coon Rapids, Iowa; Dean McHard, Agricultural Business Co.; Hugh Surles, Planters Cotton Oil and Fertilizer Co.; Ed Crouse, C. D. Liquid Fert. Co.; Kitchel, Ind.; Muriel Collie, executive secretary of the association.



## NFSA at Memphis Talks MARKETING

**F**ROM the opening kick-off address by Dean R. McHard, president, Agricultural Business Co. Inc., the National Fertilizer Solutions Convention at the Peabody hotel in Memphis, Tenn., November 9-11, stressed "getting out and plugging for business."

More than 536 were in attendance.

McHard introduced Hugh S. Surles, Jr., president of the association, who brought everyone up to date on association business. The NFSA had a net increase of 48 members over the previous year. Since the last annual meeting much had been done to benefit the members such as, insurance plans; slide films for merchandising (at a nominal sum); increased circulation; new size for "Solutions," the association magazine, and increased participation in disseminating information.

### THERE'S NOTHING WRONG WITH PROFIT

Surles took a serious turn when he warned members to "watch our corks" lest we drift unconsciously toward a possible "day of doom" for free enterprise in

our nation and the world. What we do in the next few years will be the destiny of free enterprise.

Surles said many people seem to feel that a profit is a terrible injustice; yet within fair limits, it is the strongest economic drive ever developed by civilized man. There is nothing wrong with a fair profit so long as it is tempered with the element of fair competition. They are the incentives for work and all ingenuity, he added.

### NEW SALES TOOL INTRODUCED

"All The Same—Only Different" . . . a new tool with which to inform your sales personnel was introduced by Earl K. McNew, Allied Chemical Company. Earl's presentation clearly outlined with a slide film presentation the benefits of liquid fertilizer, and in particular the labor saved in applying and handling this material.

The Coon Rapids farmer, Roswell Garst, noted for his unconventional methods of farming, spoke of the revolutions that have occurred in agriculture.

"Hybridization of corn," said Garst, "was the first great revolution in agriculture followed shortly thereafter by mechanization of corn harvesting methods. Yields of corn in bushels per acre increased from 26 bushels in the 20's to about 38 bushels in the 50's. Presently, we now have 50 bushel yields. By 1970, we will have approximately 60-65 bushels of corn per acre and other grains will increase as well."

In succession, fertilization, irrigation and the use of pesticides completed the Garst philosophy of why agriculture has made such a rapid advancement.

The future seems certain to have less and less cultivation and higher and higher yields. The Iowa farmer has found with recommended applications of Atrazine that he has been able to do away with cultivating corn.

"Despotism of custom is everywhere, a standing hindrance to human advancement" quoted Garst, in conveying the idea that we should not always follow convention.

### INDUSTRY SELLS "LAZINESS"

Garst said that the liquid fertilizer industry should be very popular since, as he sees it, it sells laziness. He pointed out that emphasis should be placed on what fertilizer, liquid or dry, makes per acre—not what it costs per acre. Demonstration plots are the best means of getting this idea across. Selling is a matter of enthusiasm, he said.

A complete program must be sold, no one segment of the industry can be emphasized, herbicides depend upon proper fertilization and good seed depends upon the proper use of both fertilizer and pesticides.

The session reopened the following day with various subjects discussed such as: Engineering Developments, Morris T. Woosley; Materials—Old and New, Dr. John L. Strauss; Water Soluble Phosphates, Dean R. McHard; and Liquid Fertilizer Market, L. W. Galloway.

F. E. Hartzler, Management Consultant, brought Management Practices to the attention of the group. One of the greatest buying incentives, he said, is convenience and this is built into the liquid industry. It is necessary to learn to merchandise what we know we can produce. A healthy distribution system is the best way to harvest profits, said Hartzler.

Bob Lemler, Aylco Chemical Co., demonstrated the Six Sleeping Giants as tools of selling to get the idea across to the farmer. They are the Salesman; Goals; Imagination; Desire; Demonstration and Service.

Management's Strangest Secret was revealed by Earl C. Nightingale. The salvation of mankind depends on how well we use our time. What is it that we can contribute to our customer to have him do something for us. In quoting Albert Schweitzer—"Men don't think"—Nightingale said this is what is wrong with mankind.

To amount to anything we have to be individuals and know where we are going. We should never conform to the great mass of people. We become what we think about; what we plant in our mind is what we live, he said. Nightingale quoting from the Scripture concluded, "As ye believe, so shall it be done unto you." ▲

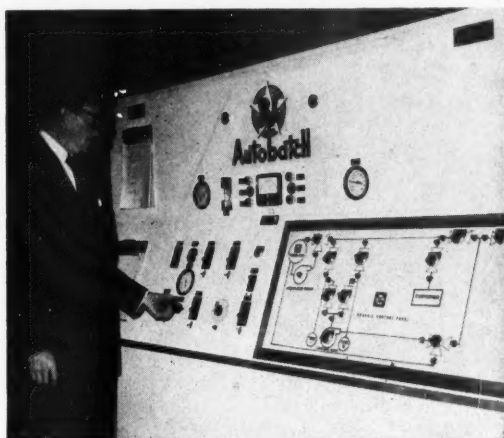
DECEMBER, 1960



Talking are L. W. Galloway, Baugh Chemical Co. and Association President Hugh S. Surles, Jr.



Above are E. C. Aylward, Aylco Fertilizer Div., Unexcelled Chemical Corp.; L. W. Galloway; J. L. Strauss, Ris-Van; D. McHard; M. T. Woosley, West Kentucky Liquid Fert. Co.



Demonstrating "Autobatch" is Bill Stephens, Barnard and Leas Manufacturing Company, Inc., at control panel.



Another display at the Solutions Convention. This one was produced and exhibited by Crown Manufacturing Company.

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# NEWS OF THE INDUSTRY

## S. S. DESOTO SAILS FOR KOREA

History was made recently when the S. S. DeSoto sailed with the largest dry cargo shipment from a Delaware Valley plant ever to leave the Port of Philadelphia. Bound for Pusan, Korea, she carried a cargo of six million pounds of urea fertilizer. Produced at the recently-completed plant of Sun-Olin Chemical Co., the urea was shipped as part of the U. S.'s program "Hands Across the Sea." SunOlin is the only major producer of urea on the East Coast.

In order to make the shipment possible, SunOlin began moving about 54,000 bags of urea, each weighing 110 pounds, by truck to the pier 11 days earlier. A fleet of tractor-trailer trucks from Mercer Motor Freight, Inc. was in constant operation from 8 a. m. to midnight. The shipment was equal approximately to 160 truck loads. This was the largest general cargo shipment delivered to the docks by trucks alone.

## RUTGERS FORUM AIRED FARM POLICY TOPICS

Farm leaders from all over New Jersey took a day-long look at some knotty and familiar problems in economics at a Rutgers Farm Policy Forum at the College of Agriculture. W. G. Stucky of the Center for Agriculture and Economic Adjustment, Iowa State University pointed out that the steel industry might be in the same fix if there were a million small steel plants across the country. Stucky outlined the farm problem and the choices—free prices or various restraints.

The forum was arranged by the Agricultural Economics Dept. at Rutgers under the guidance of Dr. Frank V. Beck.

## PROGRESS OF NEW NITROGEN PRODUCER

Construction of the \$17 million nitrogen chemicals plant of Brockville Chemicals Ltd. near Maitland, Ontario is proceeding on schedule. Production of anhydrous ammonia, ammonium nitrate and nitrogen solutions is scheduled to begin in May 1961. The decision of Sogemines Ltd., Montreal to form

Brockville Chemicals was made last year.

The latest announcement from the company advises that H. J. Baker and Bro., Inc. of New York and of Canada has been appointed distributor for Brockville's products.

## FEED BUYING PREFERENCES SURVEY

"For feed dealers, it's not who you are or what brands you sell, it's where you're located that determines your patronage nine times out of ten!" This is a major conclusion from a survey of feed buying preferences of Kansas farmers made recently by Richard J. Herder, agricultural economist at Kansas State University. In mileage terms, it was found that 90 per cent of the farmers traveled 10 miles or less to their dealer. Almost all farmers combined feed purchases with other shopping. Only a few purchased a part of their supplies directly from the manufacturer.

It was found that while brand-name feeds are important, the dealer seemed to have primary importance over the brand. The farmers expected the dealer to provide feed-related services such as credit, milling, delivery and feed information.

The results of this study have been published as Agricultural Economics Report No. 90. Copies are available from Kansas State University Distribution Center, Manhattan, Kansas.

## ORTHO DIV. PLANS NEW WOODLAND OFFICE

Ortho Div., California Chemical Co., announced completion of its plans for the construction of a new warehouse and branch office in Woodland, Calif. The contract for the job has been awarded to Lamon Construction Co., Inc. of Yuba City. Construction is due to begin immediately.

The new facility will be composed of a 10,000 square foot warehouse, dust mill and office space for the relocated branch office. Provisions are being made for the inclusion of liquid and bulk fertilizer storage and handling. Total cost for the project is estimated at \$90,000.

## DOANE HERBICIDE STUDY

Sales of agricultural herbicides in the U. S. increased almost 7 per cent in 1960 over 1959. This increase was brought about despite a 3 per cent decline in the number of farmers using chemical weed killers during the year. These changes in the market are revealed in a study just completed by the Marketing Research Div., Doane Agricultural Service, Inc. through the Doane Countrywide Farm Panel, a cross-section of the nation's commercial farmers.

The study reports that a wide fluctuation took place in the types of chemicals purchased. Pre-emergence herbicides showed an increase in sales of about  $\frac{1}{3}$  in 1960 while an 11 per cent gain was noted on post-emergence products. Farmer purchases of chemicals to kill weeds and brush in pasture or non-crop areas declined more than 40 per cent from the previous year. The percent of total acres of cropland treated remained virtually the same in 1960 as in 1959, so it is apparent, according to the report, that more intensive use of herbicides was practiced during the current year—and by slightly fewer farmers.

## FALL FERTILIZATION OF ALFALFA

Fertilizer tests plots conducted by research workers at the Maryland Agricultural Experiment Station showed that yields of alfalfa from fertilizer applied in the fall were equivalent to those obtained from spring fertilization. In one of the tests 400 pounds per acre of an 0-20-20 fertilizer applied annually in the fall gave a yield of 3.67 tons per acre of hay. When the same amount of fertilizer was applied in the spring, the yield was 3.62 tons. In this same test the plot which received no fertilizer yielded only 2.76 tons per acre annually.

These results were for a four-year period and showed that the time of application appeared to have little effect on total yield for the season.

Dr. James R. Miller of the Agronomy Dept. recommended that 500 to 600 pounds per acre of 0-15-30 fertilizer containing borax be applied annually. Fertilizers such as 0-10-20 and 0-18-36 can also be used.

## NATIONAL SAFETY COUNCIL MEETS



Ansell I. Raney, newly-elected chairman of Fertilizer Section, presents plaque to outgoing chairman Elmer C. Perrine for his contributions to the Section's activities during the past year.



Marshall Peterson, staff representative from the National Safety Council to Fertilizer Section, presents plaque to Paul T. Truitt, president of National Plant Food Institute, for his efforts in strengthening the Section.



Dr. J. R. Naden, chief medical officer, Workmen's Compensation Board, Vancouver, British Columbia, was guest speaker at luncheon meeting of Fertilizer Section.

The Fertilizer Section of the National Safety Council, which, for its size, is one of the most active sections, elected a slate of officers for 1961 at the National Safety Congress. The slate included: Ansell I. Raney, Phillips Chemical Co., chairman; Gaither T. Newman, of the Smith-Douglass Company vice-chairman; John S. Mark, Ohio Farm Bureau, secretary.

Other sessions included: revival by the mouth-to-mouth resuscitation method, medical programs for small plants, the Hartford Plan and the problem of air pollution. Safety procedures and first aid in connection with the job are to be included in a Safety Guide now being assembled by the Executive Committee for the fertilizer industry.

### EXPANSION OF CHEMAGRO

Introduction and marketing of an increasing number of agricultural chemicals has necessitated expansion and realignment of its Sales Dept. by Chemagro Corp., according to Hugh H. Swink, vice president of sales. The company has increased its sales regions from three to four with the formation of the Southern Region. Stanford L. Adams has been appointed sales manager of the newly formed Southern district. Formerly, he was in the Eastern region.

Additional shifts in personnel are: W. Scott James to headquarters at Kansas City and named director of advertising; William H. Bricker succeeds James as manager of Eastern region; Kenneth R. Holden to position of assistant director of market research.

### \$60 MILLION EXPANSION FOR ARMOUR CHEMICAL

The greater part of the expansion program of Armour Agricultural Chemical Co. will involve the construction of new facilities for the production of phosphate and nitrogen, which will approximately triple Armour's current production of these materials during 1962. A nitrogen plant will be built near Sheffield, Ala., and phosphate operations will be expanded in the Polk county area in Florida.

The Sheffield plant will produce ammonia, nitric acid, urea and other ammonia derivatives. The plant will employ 200 to 250 persons and will have a capacity of 360 tons of ammonia a day. The Florida plant will extract and process phosphate rock and will produce phosphoric acid and triple superphosphate.

### COTTON DEFOLIATION PATENT TO VA.-CAROLINA CHEMICAL CORP.

Virginia-Carolina Chemical Corp. has been issued a patent on the use of one of its new organic phosphorus chemicals for cotton defoliation. U. S. patent number 2,955,903 covers a method for applying tributyl phosphorotriothioite and was issued October 11.

The V-C phosphorus chemical, which is the basic ingredient used in the formulation of the company's defoliant, is sold commercially as merphos, while the defoliant, after having been field-tested, has been retailed under the trademark Folex since 1957.



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## NEWS OF THE INDUSTRY

### HIGH TEMPERATURES IMPROVE COTTON QUALITY

Cotton fiber strength—and consequently its spinning quality—is improved when the temperatures at which the bolls mature are kept high as a result of infrequent irrigation or wide spacing between plants and rows, a USDA scientist reports.

Experiments conducted by Dr. V. T. Walhood of USDA's Agricultural Research Service and J. R. Stockton of the University of California indicate that high boll temperatures late in the growing season result in cotton fiber of greater strength without affecting fiber thickness, yield or length. Dr. Walhood found, on the other hand, that fiber strength was reduced when air around the bolls was cooled by evaporation of water from the soil or because of heavy shade from closely spaced plants.

Irrigation experiments conducted at the U. S. Cotton Experiment Station in California showed that cotton plants receiving slightly restricted amounts of water during the growing season produced higher quality fiber than plants receiving optimum amounts.

### VULCAN CONTAINER HOLDS "CUSTOMER SERVICE" SALES MEETING

Salesmen and sales representatives of Vulcan Steel Container Co. from eleven Southeastern states met at the company's main office and factory in Birmingham, Ala., where plans were discussed and projected for a stepped-up program of sales-service to container customers throughout the South and Southeast and for a personalized

cooperation with customers and prospective container users.

This company is one of seven steel container manufacturing plants of Vulcan-Associated Container Companies, Inc.

### GIRDLER CONSTRUCTION CHANGES NAME

Girdler Construction Corp. of Louisville, Ky. recently announced a change in its corporate name to Girdler Corp. First organized as The Girdler Corp., the company operated under that name until its merger with National Cylinder Gas Co. of Chicago in 1953. Subsequent reorganizations took place in 1957 and 1958, until, in 1959 it was purchased by Chemical and Industrial Corp. of Cincinnati. Girdler Construction Corp. was formed as a totally owned subsidiary of C. and I.

The name change was made principally to reduce confusion about the scope of Girdler's activities which include process design, engineering and construction of complete chemical plants for its customers in the petroleum, edible oil and other industries.

### CALIF. CHEMICAL APPOINTS NEW DISTRIBUTOR OF ORTHO LINE IN HAWAII

Ortho Div. of California Chemical Co. has appointed American Factors, Ltd. as distributors of the Ortho line of agricultural and garden pesticides and fertilizers in the state of Hawaii.

The Ortho line includes ammonium nitrate solutions, ammonium sulfate, anhydrous ammonia, aqueous ammonia, in addition to high analysis, chemically blended and pelleted plant foods.

### THURICIDE SHOWS PROMISE FOR CONTROL OF FOREST INSECT PESTS

The microbial insecticide, Thuricide, has shown promising results in the control of gypsy moth larvae, budworms and other forest insects. Stauffer Chemical Co., which is responsible for marketing and field evaluation of thuricide, reports that three large-scale forest insect tests were run this year. They were conducted in Vermont, New Brunswick and the Queen Charlotte Islands, British Columbia.

Of particular interest to entomologists and conservation specialists is the fact that the new insecticide is non-toxic to fish and warm-blooded animals.

### OUTLINES FOUR FACTORS CRUCIAL TO SUCCESS IN CHEMICAL INDUSTRY

John R. Riley, president of Southern Nitrogen Co., Inc., Savannah, Ga., stated that it takes more than a good idea to succeed in the highly technical and competitive chemical industry. On the basis of his firm's five-year history, Riley cited these factors as crucial to the initial success of a new chemical company: knowledge and proved success in the field, sponsorship of a reputable investment banking company, a complete and independently-documented presentation and a willingness to make a substantial investment.

Southern Nitrogen manufactures ammonia, nitric acid and ammonium nitrate solution for fertilizer products.

### RISE IN SALES FOR MONSANTO CHEMICAL CO.

Monsanto Chemical Co.'s combined sales for the first nine months of 1960 amounted to \$636,564,000, compared to \$613,188,000 for the same period in 1959. Such sales include those of the parent company, its domestic and foreign subsidiaries and one-half of the sales of 50 per cent-owned associated companies.

The 1960 nine-month earnings were equivalent to \$2.01 a common share on 23,178,231 shares outstanding. In 1959, nine-month earnings amounted to \$2.18 a share on 23,156,857 shares.



At Vulcan Steel Container Co.'s "Customer Service" meeting are: D. Hoover, W. Brown, D. Lynch, R. Zuck (vice president), G. Zuck (president), G. Oxford, J. Jones, J. Carson, L. Ryan, R. Newman, R. Burr, F. Kusta (vice president), D. Baker, L. Jetter, C. Graves, C. West and G. Cook.

## HOOKER DECLARES QUARTERLY DIVIDENDS

Hooker Chemical Corp. recently declared a quarterly dividend of \$1.0625 per share on the company's \$4.25 cumulative preferred stock, payable December 28, 1960 to stockholders of record December 2.

The board also declared a quarterly dividend of 25 cents per share on the common stock, payable November 28, 1960 to stockholders of record November 2. This is the company's 96th consecutive quarterly dividend on the common stock since 1937.

Hooker is expanding its capacity for making Oldbury-brand sodium chlorate at its Columbus, Miss. plant of its Eastern Chemical Div. The program will utilize space provided earlier in existing buildings.

## NEW MIDWEST PLANT FOR CALIF. CHEMICAL

The Ortho Div. of California Chemical Co. has begun construction of their Fort Madison, Iowa plant. When completed in about one year, this \$22 million plant will

be one of the largest fertilizer production centers in the world and represents the largest single one-time investment ever made in any fertilizer facility.

## W. R. GRACE EXPANSION

Expansion project of the W. R. Grace and Co. at Memphis, Tenn. is on schedule, and it is expected that the new capacity will be on stream by spring of 1961. It will raise rated capacity 60 per cent to 160,000 tons per year and will insure adequate supplies of ammonia for the urea plant which has doubled production last year to 100,000 tons per year.

## CAMPAIGN WAGED AGAINST WEEDS

Farmers in eastern Adams county, Colorado have declared war on 214,000 acres of weed-infested land, using chemical deterrents, plows and mowers. The group of 305 has launched the campaign against Canada thistle and bind-weed.

The county, under direction of

Del Cimiyott, county commissioner, and Roy Pattison, assistant county agricultural agent, will appoint a weed control supervisor to detect weed-infested areas and see that they are thoroughly sprayed. The group plans to use soil sterilants as much as possible in place of 2,4-D weed-killing spray. Pattison estimated a 5 per cent infestation of Canada thistle and bind-weed costs a farmer with 630 acres more than \$3,000 a year.

## RISE IN INCOME FOR HERCULES POWDER

Hercules Powder Co. reported for the nine months ending September 30, 1960, net income equal to \$2.36 a share of common stock. Earnings in the first nine months of 1959 were equal to \$2.07 a share of common stock.

For the third quarter of 1960, earnings were equal to 85 cents a share of common stock, which compares with earnings in the third quarter of 1959 equal to 71 cents a share.

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Subsidiary of United Engineering and Foundry Company

General Office & Works: **AURORA, INDIANA**

## NEWS OF THE INDUSTRY

### Associations Meetings

#### ALFALFA-FERTILIZER DEMONSTRATION



County agent A. H. Underwood with Heward

In the picture above John Heward (right) and County agent Amos H. Underwood look over a sign calling attention to an alfalfa-fertilizer demonstration on Heward's farm near Holbrook, Ariz. This is one of several Arizona demonstration programs in which the National Plant Food Institute is cooperating.

#### COMMUNICATION ON FOOD ADDITIVES

The Manufacturing Chemists' Association stated recently that outcries of a few across the country against the use of food additives could endanger the nation's entire food supply. This warning against the "insidious spread of misinformation" about food additives is voiced in the October issue of the Association's "Chemical News."

The MCA also stated that those who exclaim that chemicals in the food are poisoning us fail to realize the exacting degree to which food scientists in industry, universities and government go in order to protect the nation's supply. Among the basic questions the testing seeks to answer: How much is too much, and what are the effects, if any, of an additive included in the diet over long periods of time, either in large or small doses.

#### 12TH ANNUAL FALL CHEMISTRY CONFERENCE

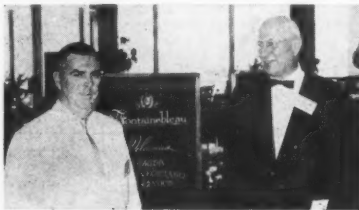
Dr. James R. Costello, Jr. of the Chemagro Corp., known for his research in plastics, textiles and insecticides, was chairman of the

12th annual Fall Chemistry Conference of the American Chemical Society's Kansas City section, held at the University of Kansas, Friday, November 18. Anti-icing compounds for jets, a nutritional index for food and recent studies of bone growth were among the topics of 23 scientific and technical reports given at the morning session. The Delaney Amendment was the subject of the afternoon session.

#### FLORIDA FRUIT AND VEGETABLE ASSN MEETS

The 17th annual meeting of the Florida Fruit and Vegetable Association was held recently at the Hotel Fontainebleau, Miami Beach, Fla. J. P. Harlee was reelected president. Also reelected were vice president, Roy Vandegrift, Jr. and secretary-treasurer, Joffe C. David.

About 1200 persons attended to discuss subjects related to sup-



At the 17th annual convention of Florida Fruit and Vegetable Association, Barclay J. Keating, sales manager, Agricultural Div., Chemical Insecticide Corp., is shown chatting with A. E. Mercker, executive director, National Potato Council.

pliers, growers, shippers and retailers of fruits and vegetables. The theme was "You Cannot Do Today's Job with Yesterday's Methods and Be in Business Tomorrow."

#### SULPHUR INSTITUTE HOLDS OPEN HOUSE



Shown at the recent open house held by The Sulphur Institute in Washington, D. C., are: C. W. Merrill, Chief, Div. of Minerals, U. S. Bureau of Mines; Dr. G. T. McBride, vice president, research, Texas Gulf Sulphur Co. and Dr. R. Leclercq, vice president, The Sulphur Institute. This discussion took place in President R. Coleman's office at 1725 K St., N. W., in the R.C.A. Building.

#### COTTON PRODUCTION—MECHANIZATION CONFERENCE

Greenville, South Carolina will be host for the 1961 Beltwide Cotton Production-Mechanization Conference. Sponsored by the National Cotton Council and other groups, the conference will be held January 11-13 at the Poinsett Hotel.

The Southeast location will enable conferees to tour cotton mills where basic processes will be explained and demonstrated. The tour is being arranged by the American Cotton Manufacturers Institute.

Some 600 federal and state research and education workers of cotton and allied industries are expected to attend. Speakers will discuss quality problems, agricultural chemicals, mechanical harvesting, irrigation, defoliation and other topics.

#### PESTICIDES REVIEW FOR THE COASTAL COUNTIES

Western Agricultural Chemicals Association and Agriculture Department of California State Polytechnic College will co-sponsor a "Pesticides Review for the Coastal Counties" February 15. William Troutner, head of Crops Department of Cal Poly, will be chairman. Speakers will be scientists from the Riverside, Davis and Berkeley campuses of University of California, plus R. Z. Rollins, chief of the Bureau of Chemistry, California State Department of Agriculture.



In foreground are: C. W. Flesher, ass't. deputy director, private enterprise, I.C.A.; E. W. Gamble, vice president, Monsanto Chemical Co. and W. Koster, Chemical and Rubber Div., B.D.S.A., U. S. Dept. of Commerce. In background are: K. D. Jacob, USDA and L. Gittinger, director, market research, Freeport Sulphur Co. Over 100 representatives of industry and government attended the official opening.

FARM CHEMICALS

# AAFCO Meeting Views Changes in Industry

Attendance at the American Fertilizer Control Officials meeting at the Shoreham Hotel October 13-14 in Washington D. C. was upped from the previous year's attendance of 145 to a total of 165, which includes representatives of the fertilizer industry, state control officials, USDA and the N.P.F.I.

Those in attendance on Thursday evening were invited guests of the National Plant Food Institute, which was highlighted by the Nixon-Kennedy debate scheduled that evening. Events preceding the debate were remarks by Paul T. Truitt and NBC commentator, Peter Harkness, who briefly discussed the presidential candidates.

Dr. S. B. Randle, New Brunswick, N. J., in his presidential address the following morning, spoke of the changes and problems confronting the industry and the work of the control officials.

Bulk shipments and custom blends on farms are areas that need increased study and service, he said. He mentioned also that non-farm fertilizer use is a critical area for control inasmuch as many home-owners become easy prey for the unscrupulous dealer (generally the door-to-door type) who sells an almost worthless product.

Charles E. Kellogg, USDA, Washington, D. C., said that American farmers have increased their outlay for fertilizer about five-fold between the years 1935-60, while the total net acreage of cropland was somewhat reduced. Direct farm labor was down about 50 per cent, and total production increased about 68 per cent—about 2 per cent per year. He said:

"We should not claim that this greatly increased agriculture efficiency was directly due to fertilizers, any more than we should say it was due to new machines, better varieties, improved water control or any other single aspect of the many combinations of practices farmers use. It takes a favorable combination of circumstances to produce even a mediocre crop."

Rodger C. Smith, Eastern States Farmers' Exchange, said that technology in the fertilizer industry is changing along with a changing agriculture; the farmer wants and needs fertilizers that more adequately meet the nutritional demands of his crops.

Dr. Ralph L. Wehunt, TVA, stated that, "Soil testing is big business and a widely accepted practice." The opportunities for increased growth are tremendous. The results, however, should be given in easier to understand language.

"Soil test summaries have been found useful in the estimation of grades and ratios needed in a given area," he said. "I have used them in conjunction with state tonnage reports." It shows the ratios needed, as compared with used ratios. This is important to the

farmers, and the industry gains by handling fewer grades.

It is Wehunt's belief that a combination of the central testing laboratory system and the county agent system is the best for the farmer.

A. L. Mehring, discussing non-farm fertilizer tonnages, said that about 2 million tons were consumed in home-use. The regional breakdown is as follows: New England, 54,000 T.; Mid-Atlantic, 219,000 T.; South Atlantic, 218,000 T.; East-north Central, 179,000 T.; West-north Central, 59,000 T.

Walter D. Scholl, USDA, reported on the results of the survey of bulk fertilizer shipments for the retail market in the United States. Total solid bulk shipments for 1959 were 2,742,447 tons, and liquid bulk shipments for the same period were 2,168,508 tons.

New Officers and Executive Committee: president, Charles Marshall; vice president, John Kuzmeski; secretary-treasurer, Bruce Cloaninger. The Executive Committee: R. Guntert, R. C. Wetherell, H. J. Fisher, W. L. Baker.

## Calendar

**Dec. 4-7.** American Institute of Chemical Engineers, Statler-Hilton Hotel, Washington, D. C.

**Dec. 5-7.** Chemical Specialties Manufacturers Association, annual meeting, Hollywood Beach Hotel, Florida.

**Dec. 5-9.** American Society of Agronomy Meeting, Morrison Hotel, Chicago, Ill.

**Dec. 8.** Science and Food Symposium, Statler-Hilton Hotel, Washington, D. C.

**Dec. 12-14.** North Central Weed Control Conference, Hotel Schroeder, Milwaukee, Wis.

**Dec. 12-14.** Water Pollution National Conference, Sheraton Park Hotel, Washington, D. C.

**Dec. 13-14.** Empire State Soil Fertility Association meeting, Ithaca, New York.

**Jan. 4-6.** Northeastern Weed Control Conference, Hotel New Yorker, New York City.

**Jan. 5-6.** Wisconsin Pesticide Conference with Industry, Memorial Union, University of Wisconsin, Madison.

**Jan. 5-7.** Agricultural Aircraft Association, annual convention, Hotel El Dorado, Fresno, Calif.

**Jan. 6-7.** Western Colorado Horticultural Society, annual meeting, Civic Auditorium, Grand Junction, Colo.

**Jan. 10.** Iowa State University Fertilizer Dealers Short Course, Memorial Union, Iowa State University, Ames, Iowa.

**Jan. 11.** Fertilizer Industry Representatives Conference, Memorial Union, Iowa State University, Ames, Iowa.

**Jan. 17-19.** Instrument Society of America Winter Instrument-Automation Conference and Exhibit, Sheraton-Jefferson Hotel (conference), Kiel Auditorium (exhibit), St. Louis, Mo.

**Feb. 2.** Chemical Buyers Group of National Association of Purchasing Agents, mid-winter conference, Commodore Hotel, New York City.

**Feb. 9-10.** Midwest Industry-Agronomists meeting, sponsored by National Plant Food Institute, Chicago, Ill.

**Feb. 14-15.** Aquatic Weed Control Society, second annual meeting, LaSalle Hotel, Chicago, Ill.

**Feb. 16-17.** Midwestern Agronomists and Fertilizer Industry Representatives, annual conference, Edgewater Beach Hotel, Chicago, Ill.

**Mar. 13-15.** Spring Meeting of Western Agricultural Chemicals Association, Disneyland Hotel, Anaheim, Calif.

**Mar. 21-30.** American Chemical Society, national meeting, St. Louis, Mo.

## NEWS OF THE INDUSTRY

### People

**Allied Chemical Corp.**, General Chemical Div. has appointed William R. Harrison northern district sales manager for agricultural chemicals. Harrison succeeds B. C. Macdonald who has been named supervisor of the division's agricultural chemical development section. Harrison will direct sales in Minnesota, Montana, North Dakota, South Dakota and Wisconsin.

**Allis-Chalmers Manufacturing Co.** named J. S. Quinn as manager of the Omaha district office, which comprises most of Nebraska and part of western Iowa. Quinn had been manager of heavy industry sales in the St. Louis district.

**American Cyanamid Co.** has promoted Frank Cooper, formerly manager of services, to Agricultural Div. general services manager and R. P. Popino to replace Cooper, who was plant manager for Cyanamid's Princeton plant. His new title is manager, Agricultural Center services.

American Cyanamid appointed Melvin C. Firman assistant to the manager of research and development, Agricultural Div., replacing Dr. J. H. Ware, who was promoted to director of product research laboratories. Prior to his new assignment, Firman was manager of technical service for the Fine Chemicals Div.

**American Potash and Chemical Corp.** announces retirement of Edward M. Kolb, assistant to the vice president of marketing and director of potash sales for the corporation. He was a member of the boards of directors of American Potash Institute and Potash Export Association. He will continue to serve his company as consultant.



Colefax

Peter Colefax, president of American Potash and Chemical, has been named by the directors to fill the position of chairman. He will continue to serve as president.

**The American Potash Institute.** Dr. W. K. Griffith has joined the Institute as eastern agronomist serving the states from Virginia to Maine. Griffith formerly served as assistant county agent in Arizona and research assistant at Purdue University.

#### Atlantic-Vulcan Steel Containers, Inc.



Hait

has named Selden G. Hait to the sales staff. Previously he was engaged in technical sales with Harshaw Chemical Co. Hait will be contacting the company's customers throughout New England and the eastern states.

**Bemis Bro. Bag Co.** has made managerial changes within the central operations of the company. S. M. Spenser has been appointed manager of the St. Louis plant and



Spenser



Robey

sales division, and S. D. Robey will be manager of the Omaha plant and sales division. Spenser replaces Philip C. McGrath, who has recently retired.

**Brooks Instrument Company, Inc.** names Philip Des Marais as applications engineer for the company. Formerly with Yarnall-Waring Co., he will be responsible for new application development and for liaison between field personnel. He is a member of the Instrument Society of America.

**Commercial Solvents Corp.** named A. W. Kinnard III as manager for the South Central district of the Agricultural Chemicals Dept. His headquarters will be in Shreveport, La. He had previously covered the state of Florida.



Dozier

president of the Georgia Plant Food Educational Society, a past director of Independent Plant Food Manufacturing Association of Georgia, and has served on the State of Georgia Extension Advisory Committee.

**Diamond Alkali Co.** appoints Harry P. Wiseman as supervisor, public relations. In the General Sales Dept., he will be responsible for the public relations program, general publicity and editing company publications.

**Flo-Tronics, Inc.** selected Thomas A. Burton, former project engineer for Union Carbide Chemical Corp., for the position of process industry sales engineer. In this newly-created position, Burton will be responsible for the sale and design of



Burton

the company's flow systems and controls in the chemical and other processing industries.

**Food Machinery and Chemical Corp.** has named Dr. Eric Rau, Charles B. Hopkins, Jr. and Dr. John F. Jones, Jr. to the Central Research Dept. at its Chemical Research and Development Center at Princeton, N. J. Dr. Rau will be working in the area of electrochemistry, while Dr. Jones and Hopkins will be concerned with the FM Coke project.

Niagara Chemical Div. of FMC appointed E. W. Kaegerbein and F. R. Racine as regional managers in the Southeastern Agricultural Dept. Dr. Oscar F. Hobart, Jr. was named the department's technical service to sales representative.

**Freeport Sulphur Co.'s** vice president, Maurice F. Dufour, becomes director of research and development. He will be responsible for activities pertaining to his department in all of Freeport's fields of interest, including operations and new enterprises.

**Hooker Chemical Corp.** elected two new vice presidents, Dr. Chris A. Stiegman and Charles C. Hornbostel at a board of directors meeting. Stiegman is now vice president of research and development and Hornbostel, of finance. They had been, respectively, director of research and director of finance.

**The Frank G. Hough Co.** has announced the appointment of Jules C. Laegeler as vice president in charge of engineering. He formerly held the position of chief engineer.



Laegeler

Additional Hough appointments are: Keith W. Kampert, chief engineer, product design; Thorvald Granryd, chief engineer, research and development.

**International Minerals and Chemical Corp.** has named Albert A. Guffey supervisor of chemical development at the corporation's experiment station at Mulberry, Fla. Guffey will be responsible for the chemical engineering and pilot plant activities. Before his transfer, he had been production superintendent at the Bonnie, Fla. plant.

IMC has promoted James R. Archer to quality control manager of the Plant Food Div. He will also take charge of the operation of the laboratory at East Point. He was formerly chief chemist of the division.

**Merck Chemical Div., Merck and Co., Inc.** has named Bruce V. Pensell, Jr. animal health products sales representative. His headquarters are in Chicago.

**Monsanto Chemical Co.** announced the following promotions and assignments in its Agricultural Chemicals Div.:

Eugene D. Smith will have responsibility for advertising and product promotion programs. Robert E. Ude will be responsible for the marketing services function, including sales forecasting and sales training programs, along with establishing and coordinating a variety of sales office operating procedures. Warren C. Geil has been appointed supervisor of the Engineering Dept.'s design section. Ford Maggard becomes traffic manager,

while Walter S. Betz becomes assistant director of traffic for the division. Charles L. Fetzner has been given the post of senior sales representative in Western U. S., a new executive position in the Agricultural Chemicals Div. He is the former western district sales manager. Robert L. Olcott succeeds Fetzner.

Arthur E. Leisy was named superintendent of the Parathion Dept. of the division. Dr. Li

## FLOMAX PUMPS...

ALL-IRON for Liquid Fertilizer  
ALL-ALUMINUM for Nitrogen Solutions  
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studs, nuts, impeller sleeve and shaft seal



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MP Pumps—FLOMAX SELF-PRIMING CENTRIFUGALS—Engine Driven (or belt or electric motor drive) are now the standard for pumping Liquid Plant Foods.

The Open Adaptor: Liquid being pumped can never touch the engine shaft or bearing or get into the engine itself.

The greaseless Seal; covered by fluid at all times. Never needs lubrication. Rides on stainless steel sleeve.

Continuous, uninterrupted operation is absolutely important. You must not have interruption of pumping during the handling or application of the liquid. You have continuous performance operation with the MP FLOMAX series.

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**PUMPS**

## NEWS OF THE INDUSTRY

Chuan Wang has joined Monsanto as a senior research biochemist for the division. Dr. Kenneth J. Shaver was appointed group leader for industrial nitrogen research.

**Morton Chemical Co.** has recently appointed Charles M. Gates to be technical sales representative for soil pesticides. He will cover six Mid-West states and Canada from his headquarters in Chicago. Larry Gallagher is the new sales representative for the company's North Central region. He will be responsible for seed treatments, seed treating equipment and grain fumigants.

**F. S. Royster Guano Co.** has announced the following assignments: Don R. Branch, assistant sales manager at the Charlotte, N. C. sales office; Ralph D. Johnson, sales representative, northwestern Ohio; Walter T. Demoise, sales representative, southeastern Pennsylvania; Robert P. Mason, sales representative, eastern Illinois.

**Sohio Chemical Co.** appoints Cecil E. Baylor as agronomist, according to H. H. Tucker, agricultural services director. George L. McGuffey becomes sales manager of national accounts in the agricultural section of the company, and Harrold W. Goodnight was named district sales manager in charge of agricultural sales west of the Mississippi.



Baylor



McGuffey



Goodnight



Frederick

McGuffey will coordinate the efforts of the field sales force for all agricultural sales to selected accounts, while Goodnight will establish an office in Kansas City where his efforts will be in support of the new ammonia and urea facilities now under construction.

John C. Frederick becomes technical service representative for Sohio. He will assist Sohio's customers in technical service aspects of fertilizer manufacture.

**Spencer Chemical Co.'s** Paul L. Sutton, manager of the company's agricultural technical laboratory, died unexpectedly at the Tulsa, Okla. airport. He has been associated with Spencer's technical activities in the field of agricultural chemicals for more than 12 years.

**The Sulphur Institute** has appointed Dr. Rene Leclercq as its vice president. He had been serving as research director for Union Chimique Belge. He will be in charge of the European office of the Institute, located in London.

Dr. Marion D. Barnes was ap-



Leclercq



Barnes

pointed to the position of industrial research director of the Institute. He will plan, initiate and pursue research projects in the industrial field.

**United States Rubber Co.** elected George R. Vila president and chief operating officer. Vila succeeds John W. McGovern, who retires after 40 years with the company. Vila served as group executive vice president responsible for



Vila

operations of the company's Nauvaton, textile, international and plantation divisions.

**Texaco, Inc.** elected William P. Gee as its vice president. He is also assistant to the senior vice president. M. F. Granville has been elected a vice president and will succeed Gee as head of the company's Petrochemical Dept.

**Vulcan Containers, Inc.** named Howard F. Krickl head technical sales-service. He was appointed to the post to provide liaison with packaging development engineers, increasingly being employed by the industries Vulcan serves. In

addition to his other duties, Krickl will represent the company in such organizations as National Institute of Packaging and Handling Logistics Engineers and the Packaging Institute.

**Witco Chemical Co., Inc.** promoted George F. Polzer to vice president in charge of purchasing, transportation, and customer relations. He will be located in the executive offices in New York City. Prior to his promotion, Polzer was executive vice president of Ultra Chemical Works, Inc., a Witco-owned subsidiary.



Polzer

### PLANS FOR NINTH STATE WEED CONFERENCE

New ways to control weeds in vegetable and small fruit crops was spotlighted at this year's annual Oregon Weed Conference at Salem. Phil Beilke was president of the meeting.

A special report on new weed control chemicals and how to use them was presented in addition to two panel discussions on weed control.

## Government

### INCOME TAX REDUCTION LAW

Attention was drawn recently to a little-known law which offers farmers and ranchers clear-cut opportunity for deducting the cost of fertilizers in income tax figuring. Stephen H. Hart, attorney for the National Live Stock Tax Committee, Denver, Colo., said that the legislation was almost obscured among final bills passed during the abbreviated session this summer.

The new amendment to the Internal Revenue Code provides that a farmer or rancher may elect to treat as ordinary business expenses those sums which are paid for or incurred in the purchase of fertilizer, lime, ground limestone, marl or other materials to enrich, neutralize or condition land. The measure also includes costs of application of such material.

Hart advised ranchers and farmers to check with their local attorneys or tax experts for details of the new law and its application to individual situations.

### GYPSY MOTH INSECT ATTRACTANT

The first reported synthesis of an insect attractant that occurs naturally in the female gypsy moth was announced by USDA. This discovery has made possible for the first time the synthesis of unlimited quantities of a related chemical which can be manufactured at low cost. It will be used in large-scale studies to determine the best way to employ such an attractant in controlling gypsy moths.

The natural form has been identified as an ester alcohol (dextrorotatory 10-acetoxy-1-hydroxy-*cis*-7-Hexadecene.) The synthetic compound has been designated as gyplure.

### INSECTICIDE APPLICATION SYSTEM FOR AIRCRAFT

Automatic treatment of the interior of aircraft with insecticides is possible with a new system developed by USDA. It consists essentially of small, one-shot aerosol sprayers, each designed to treat 1,000 cubic feet of space, placed strategically throughout a plane. When the pilot presses a button,

mouse-trap springs break off the valve tips of the containers and release the aerosol. A time or the closing of the door in the aircraft could also set the system in operation.

The insecticide containers can be made as small as one's little finger, but their size, the types of insecticides used and dosages could be varied widely to meet different conditions.

### USDA SCIENTIST HEADS AOAC

Dr. O. C. Willits, a USDA chemist, was elected president of the Association of Official Agricultural Chemists at the association's annual meeting recently. Willits, who is advancing from the office of vice president, is a prominent analytic chemist who has served as a general referee on microchemical methods for the organization. Largely for his contributions to research on maple sirup, he received USDA's Superior Service Award last year.



Willits

### SUGAR BEET EXPERIMENT

Three scientists at the Colorado State University have been granted \$78,000 for a study to find means of getting more sugar out of the beet. Dr. Leroy Powers, geneticist, Dr. Merle G. Payne, associate professor of chemistry and Dr. Willard O. Schmehl, soil scientist, will undertake the project over a period of three years.

The grant is the largest ever allotted to a single project in beet sugar research. The money comes from Stanford Research Institute, \$30,000; Beet Sugar Development Foundation and the Agricultural Research Service of the USDA, \$30,000; National Advisory Health Council, \$18,000.

### SCIENTISTS TEST FUNGUS

A newly discovered species of fungus, common to Louisiana sugarcane soils and believed to be widely distributed in nature, is being tested for possible use in biological control of nematodes, according to USDA and the Louisiana

Agricultural Experiment Station. In cooperative research *Catenaria vermicola* killed root-rot, sting, sheath, dagger, lance, ring, meadow, citrus and stunt nematodes in the laboratory. The fungus kills by penetrating the skin and growing within the bodies of the nematodes.

## Chemicals

### NEW SUBSTANCE FOR CONTROL OF PLANT DISEASES

A discovery which may revolutionize the struggle against the fungus diseases which attack crops was announced recently at the International Symposium on the Chemistry of Natural Products. Dr. D. R. Perrin and Dr. W. Bottomley of the C. S. I. R. O. Div. of Plant Industry told the meeting of the discovery of "Pisatin," a substance produced by plants in response to fungal infection.

C. S. I. R. O. scientists have recognized the possibility of producing fungicides which, like antibiotics in humans, might spread throughout the whole of plants and give complete immunity to disease.

### MEASUREMENT IN GRAIN RUST CONTROL

The day when grain rust diseases in small crops may be controlled by chemicals is closer because of a recent finding by University of Minnesota plant physiologists. Arne S. Andersen and J. B. Rowell have devised a successful means of measuring the effective life of chemicals used for systemic rust control.

Although systemic control isn't a new idea, finding the right chemical to do the job has been, and still is, a problem. Andersen and Rowell found cycloheximide derivatives—chemicals already in limited use to control white pine blister rust—will fight rust from inside the plant for as long as three weeks.

### SITUATION WANTED

Young man, mid 30's, desires position in the farm chemicals industry. Background as market analyst with two major chemical and mineral companies and associate editor with leading trade magazine. Will relocate if necessary. Available immediately for interview and employment. Vincent Squazzo, 110-D, Wallworth Apts., Haddonfield, New Jersey

## NEWS OF THE INDUSTRY

### **SPIRAL NEMATODE HITS 74 CROPS**

Donald T. Taylor's (nematologist at the University of Minnesota) most recent finding is that the spiral nematode can make itself at home in at least 74 different crops including corn, oats, barley, rye, wheat, sugar beets, clover, soybeans and potatoes. These crops are hosts for the parasites.

Because fumigation isn't practical for the average farmer, the most practical approach to nematode control seems to be in developing crop varieties with resistance to the pests.

### **CONFERENCE TO FEATURE NEW HERBICIDE DATA**

For the third year "New Herbicides from Industry" will be a special feature of the Northeastern Weed Control Conference to be held in New York on January 4, 5 and 6. Industry representatives have been invited to participate by presenting data on: new herbicides that will be available for experimental testing in the 1961 season; new herbicides now commercially available or to be marketed for the coming season; improvements made on older herbicides or extended new uses for them.

This portion of the conference will begin at 8:00 p. m. on January 4 in the Grand Ballroom of the Hotel New Yorker.

### **LETHANE CLEARED AS TOXICANT IN CATTLE SPRAYS**

Extensive residue tests conducted by Rohm and Haas Co. have been accepted by USDA as satisfactory evidence that lethane thiocyanate compound may be used safely as the toxicant for the control of such insects as hornflies, stable flies, mosquitos and gnats on dairy cattle. It is further reported that the Food and Drug Administration has concurred in the conclusions of USDA.

### **WILD OATS CONTROLLED WITH CARBYNE**

Spencer Chemical Co. has recently made a report on its selective herbicide after farm-testing Carbyne last summer on more than 16,000 acres of wild-oat infected cropland. Now in its fifth year of testing, Carbyne did an effective

job of post-emergence wild oat control. Some 850 farmers cooperated in supervised application in North Dakota, Minnesota, Montana and South Dakota.

Carbyne is credited with "saving" many fields that otherwise would have been plowed under and reseeded. The company stated that spraying experience has shown that Carbyne will fit in with the equipment used now by most farmers.

### **NEW DRY NABAM PRODUCT**

The Rohm and Haas Co. announces the availability of Dithane A-40, a new, dry nabam product for commercial use and experimental testing. It is a stable, free-flowing, yellow powder that dissolves in water and reacts with metal salts in solution. It is intended as a replacement of Dithane D-14. A 50-pound bag of Dithane A-40 is roughly equivalent to 250 pounds of Dithane D-14. This more convenient form of nabam will reach the grower at about the same cost per unit of active ingredient.

A-40 is expected to be used mainly for the preparation of tank mix zineb. It may be particularly well suited for use against certain soil-borne fungi where dry application of nabam is desirable.

### **NALCO EXPANDS FOR WEED CONTROL RESEARCH**

Nalco Chemical Co. is expanding its facilities for weed control research with the construction of a greenhouse. Here, company researchers will broaden their study of basic plant physiology in quest of new herbicides and new applications of existing herbicides.

### **BROOMRAPE CONTROL ACHIEVED**

A University of California agricultural research team has achieved control of broomrape, a serious threat to the state's tomato crop, in tests on a commercial field. The group reported that soil fumigation with methyl bromide had eradicated the dangerous parasitic seed plant from a 10-acre area near Alvarado.

In the successful tests a solution of methyl bromide was applied at a depth of eight inches in the unplanted field through 10 chisels

spaced 12 inches apart. The solution was injected at a rate of 180 to 225 pounds per acre. The team expressed the belief that the treatment offers promise for eliminating broomrape at minimum doses of fumigant at low cost.

### **HIGH PHOSPHORUS LEVEL AIDS PLANTS IN DROUGHT**

When available phosphorus level is high, crops probably will come through dry spells in good shape, according to Dr. Sterling Olsen, Colorado State University, soil scientist with the Agricultural Research Service. The dryer the soil, the more difficult it becomes for plants to "take up" phosphorus. Then, both lack of water and lack of available phosphorus may limit crop growth and yields during dry periods.

If phosphorus level is high during moist periods, however, the plants will absorb more phosphorus than they need. In drought, the plants can then draw on the phosphorus they have stored.

### **NEW TRACER COMPOUND**

A new "tracer" compound is now available to biological research workers from New England Corp. The compound, thymidine-methyl- $H^3$ , is a precursor of both RNA and DNA and can be employed for investigations of cell growth, genetic patterns, turnover, etc. Of particular interest is the fact that the substance was synthesized in a unique manner by a specific chemical reaction, and as a result, the methyl label is known to be specific. The specific activity now supplied is 2360 millicuries per millimole, and on special request specific activities several factors greater are available.

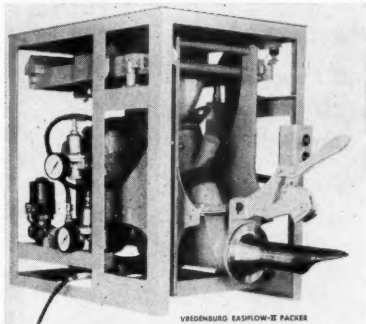
Independent laboratories have confirmed the compound's biological activity, while chromatographic analysis has shown it to be radiologically pure.

### **CCA ADDS FOUR "DRY- MIX" PLANTS**

"Prescription mixing" fertilizer centers will be established by Consumers Cooperative Association at Eagle Grove, Lake City and Marathon, Iowa and Scottsbluff, Neb. New plants will be built for each of the latter three.

## Equipment Supplies

### EASIFLOW PACKERS



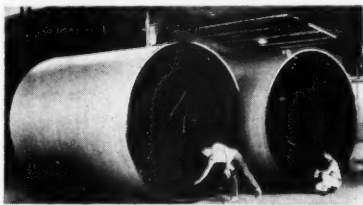
A new, compact multiwall valve bag packer, designed for easy installation and weight accuracy, has been introduced by St. Regis Paper Co. Two models are available: the Easiflow I for granular, free-flowing materials and the Easiflow II for powdered, dusty materials.

These screw packers are designed for filling 25- to 50-pound bags. Up to four bags per minute can be packed on either machine, dependent upon product characteristics and density.

Packers are bin-mounted and can be installed by attaching them to bins with eight cap screws. For details,

CIRCLE 398 ON SERVICE CARD

### SEAMLESS PLASTIC COATING FOR ACID SERVICE



Two huge tanks, believed to be the largest ever coated with plastic on the west coast, have been seamlessly lined with Paralene RD polyvinyl chloride plastic by The Barber-Webb Co., Inc. The job was made feasible by the company's new oven measuring 11 x 11 x 40 feet.

The coating material is a specially compounded vinyl plasticol made by Metal and Thermit Corp. The finished surface is highly resistant to abrasion and impact, as well as to acids, alkalies, salt water and other corrosives.

For more information, simply  
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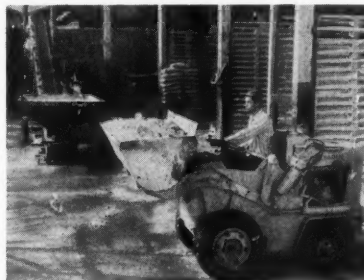
### STRAIGHT CENTRIFUGAL MP PUMPS

Marine Products Co. has announced a straight centrifugal series 15000. Each pump in the line is available in either all-bronze or all-iron construction. Some of the features are: straight key seated shaft, safety shaft slinger and weep hole, priming connection which permits installation of pump above liquid level and mechanical seal which eliminates leakage, gland adjustment and shaft wear. A brochure describing the series can be yours by

CIRCLING 400 ON SERVICE CARD

### H-25 PAYLOADER

Shown is a model H-25 Payloader tractor-shovel, made by The Frank G. Hough Co., working in the factory of the National Ferti-



lizer Co. of South Sioux City, Nebraska. It has an operating capacity of 25,000 pounds.

Besides this model, Hough produces a Model HA Payloader. Both Hough machines handle all the material, raw or bagged for shipment, in this fertilizer plant.

### ADJUSTABLE RICHARDSON SEWING PEDESTAL

A new sewing pedestal by Richardson Scale Co. will adjust vertically and horizontally to suit various bag heights and widths, different sewing heads, filter cords and tape sealers, thus eliminating need for a two-headed pedestal.

Vertically, the height of the needle can be varied from 20½ inches to 48 inches; the horizontal adjustment ranges from 19 to 27 inches.

Raising and lowering the sewing head is accomplished by turning a hand wheel operating a stainless steel cable through a positive ratchet for raising, and through a clutch for lowering. It uses no counterbalance weights or springs.

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- 1—Louisville 7' x 70' rot. cooler, 1/2" welded.
- 2—Bonnet 7' x 60' rot. dryers, 5/8" shell.
- 1—Allis-Chalmers 7' x 50' rot. dryer, 5/8".
- 2—Bonnet 6' x 52' rotary dryers.
- 1—Louisville 6' x 50' steam-tube dryer.
- 2—18,000 gal. vert. alum. tanks.
- 1—Richardson bagging scale, complete.

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### PLASTIC AIR-TIGHT MASK

Willson Products has developed a "Tite Seal headgear" which has been approved by the Bureau of Mines. Contour fitting plastic allows headgear to fit any size or shape head.

Two adjustments produce an air tight seal—one in back and one on top. It can be cleaned with soap and hot water.

You can get more details if you  
CIRCLE 401 ON SERVICE CARD

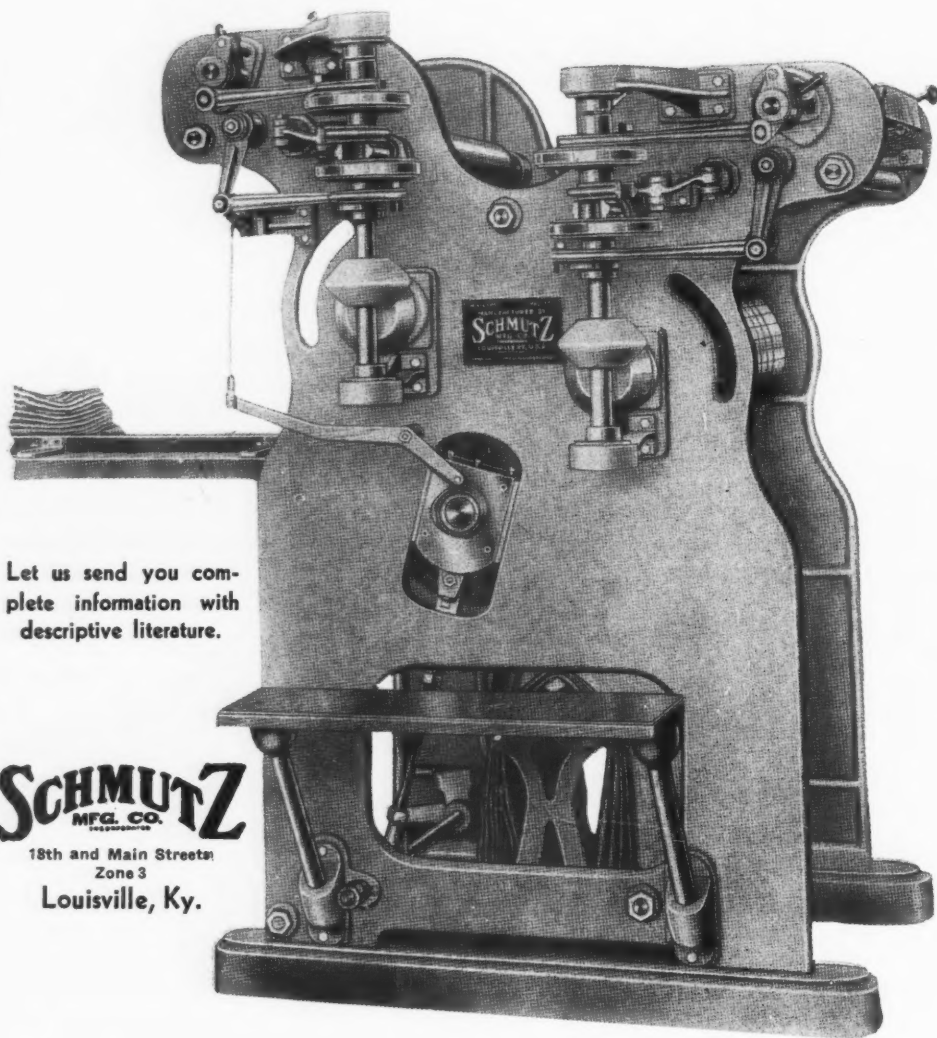
### YALE FORK LIFT TRUCK

Yale's fork lift truck has a short turning radius of 70 inches for the 3,000-pound capacity model G-54 and lift speed of 80 feet per minute empty and 75 feet per minute fully loaded.

The truck has an automatic torque transmission. The cushion tire model utilizes a single range

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constant mesh type, while the pneumatic tire model utilizes a two-speed range transmission. Both feature interlocking I-beam mast construction. Capacities available include 4,000 and 5,000 pound models, in addition to the 3,000 pound model.

Complete information is available. Just

CIRCLING 402 ON SERVICE CARD

### INDIAN JUTE MILLS] ASSOCIATION DELEGATION

A delegation from Indian, Jute Mills Association, Calcutta, India visited the U. S., Canada and Argentina in mid-October and early November to meet with members of the Burlap trade in these markets for discussion of present industry conditions in Calcutta and the outlook for jute goods in these principal overseas markets.

An extensive itinerary was planned that took the men to a number of the large burlap trade centers of the U. S., Canada and Argentina, as well as the fall meeting of the Textile Bag Manufacturers Association at Point Clear, Ala.

The following data reported recently by USDA analyze packaging and distribution patterns in fertilizer industry:

By Size of Bag		
Total		84.0%
Less than 50 lbs.....	2.0	
50 lbs.....	10.0	
80 lbs.....	65.0	
100 lbs.....	2.0	
Over 100 lbs.....	5.0	

By Kind of Bag		
Total		84.0%
Cotton.....	.5	
Burlap.....	4.5	
Paper.....	79.0	

By Type of Distribution		
Total		100.0%
Bulk Dry.....	10.0	
Bulk Wet.....	6.0	
Mixed Bagged.....	84.0	

Over 15 million tons of mixed fertilizer were consumed in the U. S. last year. Bulk deliveries have not been significant with paper bags accounting for the lion's share—79 per cent—of the packaged product. Only 4.5 per cent of the total was shipped in burlap.

DECEMBER, 1960

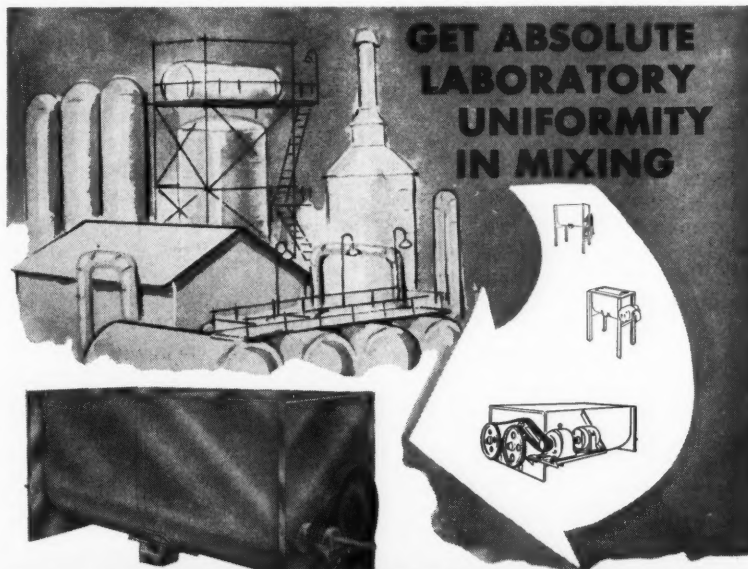
## Suppliers Briefs

**Continental Can Co.**, Flexible Packaging Div. took two achievement awards in the 1960 Flexible Packaging Association competition with four new packages for Agricultural Laboratories, Inc. Made of cellophane and polyethylene, the new packages maintain bacteria life within the product better than the plastic package formerly used. The cost-cutting new pouches are

automatically formed, filled and sealed. Improved package appearance is reported to have increased sales of this product, plant legumes.

**Dorr-Oliver's** Board of Directors, at its quarterly meeting, elected William L. Oliver chairman. He has been vice chairman of the board since 1956 and also serves as general counsel for the corporation.

**Highway Equipment Co.** has announced that Valley Equipment Co. is one of its new distributors.



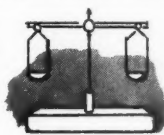
## THE Marion MIXER IS THE LEADER FOR FERTILIZERS, AGRICULTURAL CHEMICALS & POWDERS

**THE Marion MIXER** offers better and lower cost mixing for the chemical industry. An exclusive Mixing and Blending Action makes possible the mixing of any top quality mixed product at less cost.



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THE MARION MIXER, now in use in many chemical plants throughout the country, is designed to produce the highest tonnage at the lowest possible cost. Also, its simple but efficient design makes it an ideal special formula mixer.

The MARION MIXER is the leader for mixing: Dry and semi-wet chemical powders—Agricultural chemicals — Fertilizers — Materials for chemical processing plants — Insecticides.

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# PEST REPORTS

F  
C

By Kelvin Dorward\*

**T**HE *fall armyworm* was destructive over a wide area throughout October. Early in the month, heavy infestations of the larvae were causing extensive damage to young small grains and turf grasses over the entire northern half of Texas. Damage was continuing in the central and north central part of the state by the latter part of the month. Some young grain was completely killed or severely damaged, and resowing was necessary. Populations of the insect ranging from 2 to 100 per square foot were reported from southern Oklahoma in early October.

## SUPPLIERS' BRIEFS (Continued)

Valley serves portions of the states of Missouri and Illinois.

Nienberg Supply has also been announced as a new distributor for Highway Equipment. Nienberg serves portions of Ohio and Michigan.

**Nutrilit Products, Inc. and Pennsalt Chemicals Corp.** announced that they are in the process of completing details for a joint effort in manufacturing and marketing biological insect products. An agreement for exclusive national representation is expected to be reached shortly.

Both companies have stated that Pennsalt, through its Agricultural Chemicals Div., will contribute its experience in marketing, field trials of new products, market studies, etc., while Nutrilite will continue its research activities and will produce the biological insect products.

**West Virginia Pulp and Paper Co.** is moving ahead with its major overhaul and buildup of multiwall manufacturing facilities by investing \$700,000 in improvements at Wellsburg, W. Va. Installation of a new high-speed, stepped-up tuber, bottomer, press and bag machine will increase production from 3 to 6 million bags per month.

The expansion program also includes construction of a new warehouse of concrete tilt slab and the winterization of present storage facilities. The entire project will be completed early next year.

Destructive populations of the fall armyworm were found in scattered small grain and alfalfa fields throughout Tennessee. Controls were applied to several thousand acres of newly seeded alfalfa, small grain and pastures in the central part of the state. Fall armyworms were abundant and causing damage to fall-seeded wheat in the extreme southern area of Illinois. The insect was reported from Arkansas as being present in some fields of fall-sown small grain. In Alabama larvae were found in grain sorghum in Lee county, in oats in the Tennessee Valley and in barley in Lauderdale county.

The *southwestern corn borer* was taken for the first time in Tennessee in Shelby county during September. Since the initial collection, the insect has also been found in Tipton county. In a recent survey in Arkansas the per cent lodging to corn, due primarily to the southwestern corn borer, was recorded as follows: north central area 4.3 per cent, northeast 4.4 per cent, east central 10.1 per cent and southeast 5.8 per cent. Although late corn represents only a small part of the total crop in Arkansas, in extreme cases 30 per cent or more of this crop lodged. This borer heavily infested the majority of the cornfields in eastern New Mexico counties and occasional infestations were found in roots of broomcorn and grain sorghums.

In the fall abundance survey for *European corn borer* in Cass and Richland counties, North Dakota, 98 per cent of the inspected plants were found infested with an average of 474 borers per 100 plants. This is the heaviest infestation ever recorded in the state. In Grand Forks and Traill counties the average infestation was 89 per cent with 269 borers per 100 plants. This is a record infestation for these counties. The fall abundance survey in 15 West Virginia counties showed an average of 58 European corn borers per 100 corn stalks. In Virginia the insect was taken for the first time in Bath county near Warm Springs.

\* Chief Staff Officer, Survey & Detection Operations, Plant Pest Control Div., Agricultural Research Service, USDA.

Although the *spotted alfalfa aphid* was generally light from most states reporting in October, it continued to cause damage in some areas. Damage to alfalfa occurred in the Buttercreek and Cecil areas of Morrow county, Oregon. Injury was noticeable in fields in the Butler Creek area of Umatilla county, and light populations were found in all alfalfa fields checked in Malheur county. Economic populations of the aphid were reported from Asotin and Walla Walla counties, Washington. In Idaho populations were on the increase with counts up to 60 per sweep in 6-inch high alfalfa in Canyon county.

In the central area of Arizona the spotted alfalfa aphid increased in early October, principally on fields planted to susceptible alfalfa varieties. Heavy populations occurred in Oklahoma as far east as Claremore, but in areas of local rains populations were on the decline. The insect continues to present a threat to fields of fall-seeded alfalfa over most of Oklahoma.

During October, the *white-fringed beetle* was reported from two states in which it had not previously been collected. One specimen was found on September 23 in Fulton, Fulton county, Kentucky. Eradicative measures were to be taken, and additional delimiting surveys were initiated. In Greensville county, Virginia specimens were collected October 12, 1960, on a strip of land between U. S. Route 301 and the Atlantic Coast Line Railroad within a few yards of the North Carolina line. Additional surveys were undertaken, and eradication measures were to be applied shortly.

Last month, white-fringed beetle was found in Beaufort county, North Carolina for the first time. Infestations were recorded in October from Jones, Stanly and Halifax counties, North Carolina, Benton county, Tennessee and Webster county, Georgia.

Among vegetable insects *cabbageworms* were the most active over a wide area. Populations of *cabbage looper* were high on cabbage in central and southwest Arizona during early October.

# PATENT REVIEWS

By Dr. Melvin Nord

## GRANULATION OF FERTILIZERS

U. S. 2,945,747, issued July 19, 1960 to Francis T. Nielsson and assigned to International Minerals & Chemical Corp., provides a rotating granulator or ammoniator equipped with acid and ammonia distributors positioned below the surface of the tumbling bed of fertilizer solids.

Figs. 1 and 2 show the inclined rotary cylindrical drum 10, fitted with tires 11 and spur gear 12, mounted on trunnion 13 and driven through gear 14. Feed chute 15 feeds solid fertilizer components from conveyor 16 to the feed end of drum 10. Ammonia is fed through manifold 19 mounted within drum 10, and aqueous acidic solution is fed through a similar acid manifold 24. Water for cooling is added through line 25. Air is passed through the drum by hood 26, duct 27 and fan 28.

## PESTICIDES

U. S. 2,947,111, issued August 2, 1960 to Leo Zobrist and assigned to Dr. R. Maag, Ltd., discloses a systemic fungicidal solution containing a novel reaction product of an ethylene polyamine, carbon disulfide, an alkaline hydroxide and  $R_2NH \cdot HX$  (R being methyl or ethyl, X being chloride, bromide, sulfate, phosphate or nitrate).

U. S. 2,947,659, issued August 2, 1960 to Charles H. Rogers and assigned to R. T. Vanderbilt Co., Inc., describes a method of making a stabilized Bordeaux mixture.

U. S. 2,947,660, issued August 2, 1960 to Otto L. Hoffmann and assigned to Spencer Chemical Co., discloses a composition for treating nematodes, which contains an al-

pha, omega-dihaloalkane such as 1,5-dibromopentane.

U. S. 2,947,661, issued August 2, 1960 to Thomas R. Hopkins and Paul D. Strickler, assigned to Spencer Chemical Co., discloses a nematocide composition consisting of an adduct of 1,2-dibromo-3-chloropropane and thiourea.

U. S. 2,947,662, issued August 2, 1960 to Raffaello Fusco, Giuseppe Losco and Mario Perini, assigned to Montecatini, Societa Generale per l'Industria Mineraria e Chimica, discloses the pesticidal properties of o-o-dialkyl-dithiophosphoric acid esters.

U. S. 2,948,653, issued August 9, 1960 to Abraham Bavley and Bryce E. Tate, assigned to Chas. Pfizer & Co., Inc., discloses the use of itaconic acid diester adducts as plant fungicides.

U. S. 2,949,399, issued August 16, 1960 to Chien-Pen Lo and assigned to Rohm & Haas Co., discloses the fungicidal properties of 2-thiocyanomethyl-1,2 benzisothiazolin -3-one-1, 1-dioxide.

U. S. 2,946,720, issued July 26, 1960 to Norman J. Lewis and assigned to Monsanto Chemical Co., describes a method of treating nematodes with a heterocyclic methyl isothiocyanate.

U. S. 2,946,716, issued July 26, 1960 to Frederick A. Hessel and assigned to General Aniline & Film Corp., describes a method for controlling and eradicating mites and ticks by use of acetylenic diol.

## FERTILIZERS

U. S. 2,947,112, issued August 2, 1960 to Willard L. Morrison and assigned to The Union Stock Yard & Transit Co., provides a method

of promoting vegetable growth by burning fuel in an engine which pumps irrigation water and absorbing the exhaust gas in the irrigation water, thereby providing fixed nitrogen compounds to the soil.

U. S. 2,947,269, issued August 2, 1960 to Edgar M. Queeny and assigned to Monsanto Chemical Co., provides a method of fertilizing soil with elemental yellow phosphorus.

U. S. 2,947,619, issued August 2, 1960 to Harry B. Gorby, provides a method for rapid composting of municipal organic waste material by aerobic fermentation.

U. S. 2,948,589, issued August 9, 1960 to James G. Gilchrist, assigned to International Minerals & Chemical Corp., describes a method of producing granular precipitated dicalcium phosphate.

U. S. 2,948,602, issued August 9, 1960 to Leonardus J. Revallier and William Slot, assigned to Stamicarbon N. V., describes a process for producing from fluorine-containing raw calcium phosphate a mixed fertilizer containing nitrogen, calcium and phosphate which is completely soluble in ammonium citrate.

U. S. 2,949,342, issued August 16, 1960 to Alfred M. Thomsen, describes a method of producing sodium and potassium sulfate from pegmatite.

U. S. 2,950,007, issued August 23, 1960 to William A. Smith and Victor A. Zandon, assigned to American Metal Climax, Inc., discloses a method of recovering potash values from sylvite-containing potash ores by froth flotation.

U. S. 2,950,171, issued August 23, 1960 to Andre Macq, assigned to Union Chimique Belge, S. A. and Manufacture des Glaces et Produits Chimiques de Saint-Gobain, S. A., provides a process and apparatus for the manufacture of phosphoric acid from natural phosphate and sulfuric acid.

U. S. 2,950,183, issued August 23, 1960 to Alexander A. Niketin, Charles C. Fite, Jr. and Janet S. Gary, assigned to Tennessee Corp., discloses a nutrient spray composition for plants, containing ammonium phosphate, oxalic acid and trace metals.

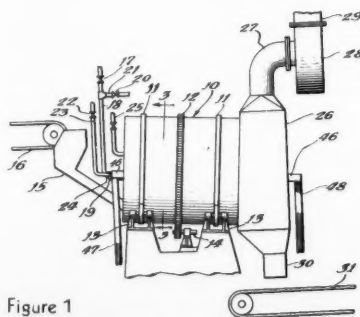


Figure 1

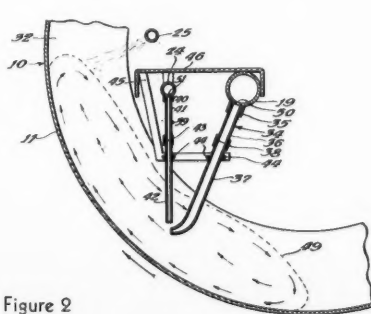


Figure 2

## RESEARCH PROGRESS

*in Missouri and its Importance  
to the fertilizer industry.*

By C. M. WOODRUFF\*

ONE might suppose that the understanding of soils, fertilizers and plant nutrition in the year 1960 would be sufficiently complete that results of current investigations would add little to the accumulated knowledge. But advancements along one line beget problems along others, so that continuous study and research are necessary.

### IONIC BALANCES—K, Mg AND Ca

The operating ranges of ionic balances amongst potassium, magnesium and calcium ions on the exchange complex of the soil set at 2 to 5% of K, 10 to 15% of Mg and 65 to 85% of Ca for interpretations of the results of soil tests in Missouri, were investigated over wide ranges of the respective cations. The test crop was soybeans which was grown in the greenhouse on soils with the exchange complexes saturated with bases.

Maximum yields of mature seed were obtained with 2% to 4% of potassium, 16% to 80% of magnesium and 16% to 80% of calcium. Yields of soybeans decreased very rapidly as the percentage of K in the soil fell below 1%. Yields declined steadily as the percentage of potassium increased above 4%. Complete failure of the crop occurred with 20% of K on the exchange complex.

The decline in yield with decreasing magnesium below the optimum of 16% was very slow. A maximum yield of 80% was obtained with less than 5% of magnesium on the exchange complex.

The decline in yield with decreasing percentage of calcium below the optimum of 16% also was very slow. Thus calcium and magnesium substituted one for the other over wide ranges in the exchange complex of the soil. And magnesium did not limit the yield of soybeans seriously until the percentages in the exchange complex fell below 5%.

The significant feature of the results of this investigation was the depression of yields by potassium in

excess of 4% on the exchange complex of the soil. Results of numerous investigations reported in the literature show similar depressions in yield, attributable to an excess of potassium. However, the energies of replacement of potassium from the soils containing excess potassium were found to be within the ranges considered to be optimum for nutrient solutions. It was reasoned therefore that potassium was interacting with some other element so that the depression in yield was caused, not by the effect of potassium on the plant, but by the effect of potassium upon some other element which was essential for the plant. Results of later investigations showed that there was an interaction between potassium and boron.

### INTERACTION OF K AND B

An interaction between potassium and boron reported in some of the fundamental investigations of 15 to 20 years ago generally has not been recognized by current workers in the field of soil fertility and plant nutrition. Yet, most of today's workers are cognizant of the fact that boron deficiencies occur frequently when alfalfa is top dressed with potassium, so that fertilizers for alfalfa often are compounded with small amounts of boron.

Soybean plants grown on soils with over 4% of potassium in the exchange complex contained lower percentages of B, Ca and Mg than those grown on soils with 2% of K in the exchange complex. By the addition of 1 pound of elemental boron per two million pounds of soil, normal growth and normal composition of the bean plant with respect to B, Ca and Mg were maintained with as much as 20% of K in the exchange complex of the soil.

The advisability of providing at least one pound of boron with each 100 lbs. of  $K_2O$  in fertilizers that are spread and mixed with soils should be given consideration.

### PHOSPHATE FOR CORN

Fast growing annual plants like corn require high concentrations of phosphorus ( $2.5 \times 10^{-6}$  mols per liter) in the soil solution during their early stages of development. As they approach maturity much

\* University of Missouri. Presented at the joint meeting, Agronomists with the Fertilizer Industry, sponsored by the National Plant Food Institute, February 11-12, 1960, Chicago, Ill.

lower concentrations ( $0.5 \times 10^{-6}$  mols per liter) are sufficient. The quantities of acid processed phosphate fertilizers required to establish even moderate concentrations of phosphorus in the solution of soils that initially are low in phosphorus may be very great. Eighteen months after mixing 800 lbs. of  $P_2O_5$  per acre as 0-40-0 with a soil that initially tested 15 lbs. of  $P_2O_5$  per acre using Bray strong acid extraction, the soil tested only 125 lbs. of  $P_2O_5$  per acre, and contained only  $0.6 \times 10^{-6}$  M/L of P in the soil solution.

Thus broadcast applications of phosphorus, unless used annually in appreciable amounts, fail to provide the high concentrations of phosphorus that are desirable for young corn plants.

Banded applications of 50 lbs. of  $P_2O_5$  as the mono ammonium phosphate and as the partially ammoniated superphosphates drilled with the corn at planting time would appear to be desirable even on those soils that have been treated with large amounts of phosphorus in the past.

Results of field experiments obtained in 1958 and 1959 were as follows:

#### Sizes of Young Plants June 24, and Final Yields of Corn on Limed Soils 1958

Row Treatments	1 No banded $P_2O_5$ Size gms Yield bu		2 50% $P_2O_5$ as $CaHPO_4$ Size gms Yield bu		3 50% $P_2O_5$ as $NH_4H_2PO_4$ Size gms Yield bu	
	Size gms	Yield bu	Size gms	Yield bu	Size gms	Yield bu
No basic treatment with phosphorus.....	22	62	61	97	144	115
800 lbs. $P_2O_5$ Disc'd in and plowed under in May, 1958.....	65	106	93	119	139	120

100 lbs. of N and 100 lbs. of  $K_2O$  were broadcast and plowed under before planting corn. 12 lbs. of N as ammonium sulfate were drilled with corn for row treatments Nos. 1 and 2. Treatments were replicated twenty-two times. The least significant difference in yield at the 5% level of significance was 6 bushels per acre. The dicalcium phosphate used in row treatment No. 2 is the water insoluble form of phosphate that is produced by over ammoniation of superphosphate. It was only partially effective for the young plants, but increased in effectiveness as the plants approached maturity.

In 1959 the experiment was repeated on the same plots that were used in 1958. No additional phosphate was plowed under. The basic nitrogen treatment was increased to 180 pounds per acre of N and that drilled in the row was omitted. 200 lbs. of  $K_2O$  were plowed under. The water soluble triple superphosphate was substituted for the insoluble dicalcium phosphate for row treatment No. 2. The season was very dry.

#### Corn yields in 1959 as influenced by the previous basic treatments of 800 lbs. of $P_2O_5$ and by row treatments with triple superphosphate and monoammonium phosphate

Row Treatments	50 lbs. of $P_2O_5$ 50 lbs. of $P_2O_5$ 2-as 3-as mono $CaPO_4$ mono $NH_4-PO_4$		
	1-None	2-as mono $CaPO_4$	3-as mono $NH_4-PO_4$
No basic treatment with phosphorus.....	62 bu.	73 bu.	79 bu.
800 lbs. $P_2O_5$ in 1958.....	70 bu.	76 bu.	81 bu.

DECEMBER, 1960

Each row treatment was repeated twenty times. The least significant difference at the 1% level of significance was 2.4 bu. per acre. Although partially ammoniated superphosphate was not used in the experiment, there is no reason to believe that it would not approach in performance that of the ammonium phosphate that was used.

The results of the two years of investigations suggest that the phosphorus requirements of corn growing in soils that are very low in phosphorus may be met by the banding of 50 lbs. of  $P_2O_5$  near the seed provided that the phosphorus is accompanied by small amounts of nitrogen of the ammonium form. With the possible benefits that may be derived also from small amounts of potash in the fertilizer band it would appear that the ideal fertilizers for side band placement with corn would be of the 1:3:1, 1:4:1, and 1:4:2 ratios. Additional nitrogen which usually is needed, and phosphorus and potassium for raising the level of these elements in the soil may be spread and plowed under ahead of the crop.

#### EFFICIENCY OF RECOVERY OF NITROGEN FERTILIZERS BY CROPS

Missouri farmers in 1958 used 110,000 tons of nitrogen at a cost approaching 25 million dollars. Results of some field experiments after applications of N were disappointing, suggesting the need for an investigation of factors that affect the efficiency of utilization of N by crops.

Work with N-15 demonstrated denitrification of fertilizer nitrogen that differed according to the kinds of soils and their treatments. Perfect efficiency in the recovery of fertilizer nitrogen by crop plants is not to be expected, but the efficiency of recovery was particularly low from some specific soils. Some materials were used more efficiently when mixed in the soil. Losses were great when nitrogen spread on the surface remained there some time before it was carried into the soil by rain. The supplies of other nutrients in the soil was a major factor governing the recovery of nitrogen by plants.

#### Recovery of added nitrogen\* from soils of Sanborn Field by Sudan grass

Past cropping system	Soil treatment	Recovery—1 %
Corn continuous.....	None	12
Corn continuous.....	Manure	38
Wheat continuous.....	Full treatment	48
Timothy continuous.....	None	12
Timothy continuous.....	Manure	30
Rotation.....	None	15
Rotation.....	Lime and starter fertilizer	26

\*Average of 5 nitrogen carriers, 2 moisture levels, with surface and mixed applications at one moisture. Replicated three times.

Experimentally, quart cans of soil were treated with five different kinds of nitrogen, both on the surface and mixed in the soil, at a rate of 1000 lbs. of N per acre two million pounds of soil. These were incubated four months at different moistures and different temperatures. Sudan grass was grown on the soil until the plants developed nitrogen deficiencies after which

(Continued on following page)

## TECHNICAL REVIEW

### RESEARCH PROGRESS

(Continued)

the entire plant including the roots was analyzed for nitrogen. All treatments were in triplicate.

The percentages of added nitrogen recovered by Sudan grass ranged from 12% on soils that had been cropped to different systems without soil treatments to as much as 48% where the past 70 years of cropping had included full treatment of the soil with chemical fertilizers.

The results obtained suggest that the recovery of added nitrogen may be very low from soils which are deficient in the essential mineral elements.

#### INFLUENCE OF MOISTURE

Numerous combinations of very dry summers followed by summers with ample moisture have occurred in Missouri during the past decade. Yields of crops in the years following dry summers have tended to be above normal and responses to fertilizers have been below normal. The usual explanation for these effects has been that unused nutrients accumulated in the soils in dry seasons; and these were available to the crops the succeeding season. However, when soils that were irrigated during the dry season were fertilized heavily the following season, the resulting yields of crops were substantially below those of the crops from the previously unirrigated soils. Consequently some other factor than an accumulation of available nutrients during dry seasons must be responsible for the excellent performance of crops following years of subnormal rainfall.

**Effects of season and irrigation on yields of fertilized continuous cotton**

	1956	1957	1958
Rainfall in July and August.....	4.2	10.6	6.4 inches
Irrigation water applied.....	12.0	0.0	4.0 inches
Yields of seed cotton—Unirrigated..	432	316	572 lbs.
Yields of seed cotton—Irrigated....	754	248*	561* lbs.

\*Yields below expectations.

**Effects of irrigation on yields of fertilized continuous corn in dry seasons and for the succeeding year**

	1950-1951		1957-1958	
Unirrigated.....	70	102	51	112
Irrigated.....	85	94*	103	92*

\*Yields below expectations.

Considering the average yield of cotton in the state for the period 1918 to 1954, if the rainfall for January through April were below normal, the yield of lint averaged 350 lbs. per acre as contrasted with 224 lbs. per acre for the years when the corresponding rainfall was above average. And where the rainfall of the previous season was below normal, the yield of lint was 395 lbs. per acre as contrasted with 305 lbs. per acre where the rainfall of the previous season was above normal.

With continuous corn growing on Sanborn Field, similar trends were evident. Average yields of corn for 20 years when rainfall of previous season was above normal—3717 bu. Average yields of corn for 24 years when rainfall of previous season was below normal—48.7 bu.

Data from the Morrow Plots in Illinois suggest an

interaction between the effects of the season and the treatments of the soils on yields of corn.

**Relation to normal of rainfall of Previous Year**

	Below	Above
Continuous corn—no treatment.....	31.2	26.6 bu./A
Continuous corn M L P.....	22.7	32.7
Rotation—no treatment.....	52.3	47.7
Rotation—M L P.....	71.5	77.5

The yields of both the continuous corn and the rotation corn averaged less following seasons of above normal rainfall, provided that the soils had not been treated. But where the soil had been treated the yields were superior following years of above normal rainfall.

Using the deviations from the normal of the average yields of corn by counties in Missouri, it was found that yields were higher following dry seasons where the predominant soils of the counties were underlain by claypans or contained excessive amounts of clay. Yields were superior following wet seasons where the predominant soils of the counties possessed good internal drainage.

The explanations for the differential behaviors of well drained and poorly drained soils following seasons of abnormally high or abnormally low rainfall might be associated with the states of oxidation of iron and manganese in the soils. This subject is being investigated. But regardless of the causes for the differential behavior of the crops with respect to season, it appears desirable to fertilize more heavily than normal following wet seasons and lighter than normal following dry seasons.

#### SUMMARY

- 1) The optimum balances of potassium, magnesium and calcium in soils with exchange complexes saturated with these three bases were found to be from 2 to 4% of K, from 16 to 18% of Mg and from 16 to 80% of Ca, as measured by the yields of soybeans.
- 2) The effects of deficient amounts of boron in soils were intensified by the presence in the soils of greater than normal amounts of potassium.
- 3) a) The band placement of 50 lbs. of  $P_2O_5$  for corn was more effective than 800 lbs. of  $P_2O_5$  mixed with the soil on soil that was very deficient in phosphorus.  
b) Banded phosphates were more effective for corn when accompanied by small amounts of ammonium nitrogen in the fertilizer band.
- 4) The efficiency of recovery of fertilizer nitrogen by Sudan grass was greatest from those soils containing satisfactory amounts of the essential mineral elements. Recovery was lowest from those soils that were deficient in lime and phosphorus.
- 5) Soils irrigated the previous season or subject to excessive amounts of summer rainfall frequently produce less the following season than those which have dried to great depths. Reduction of manganese and iron by wet soil conditions is suggested as an explanation for the adverse effects of the wet soils. ▲

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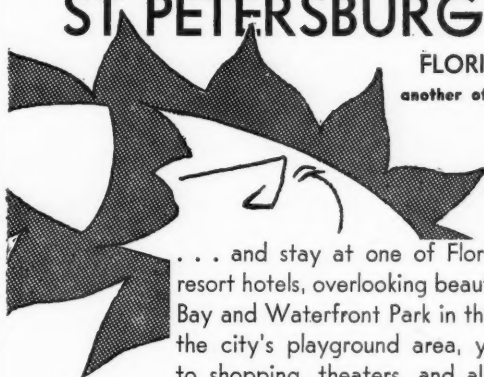
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. . . we'll be well on our way toward crops with built-in resistance to insects and diseases.

*Now does that last item disturb you?*

It shouldn't disturb you too much if your company and dealers are "mentally, physically, procedurally, and organizationally" committed to *serving the farmer*.

What do I mean by that statement? Just this: Now is the time to ask yourself: Just what business are we in—and what business will we be in as farming continues to change?

If your company is committed to *selling pesticides and/or fertilizers* in 1960, it's a pretty safe bet that it will continue along with the same *sales* approach through the 60's. And if it does, the company will be in real trouble by 1970 or 1975!

That's because you'll be in the wrong business. The *right* business to be in these days—and those to come—is *filling farmers' needs!* And the only approach that will do that job is the *marketing* approach.

In speaking to those attending the second annual Farm Chemicals Marketing Seminar (FCMS) in New York City last month, the plight of the railroads was brought out dramatically by Eugene Mapel, vice president of Chase

Manhattan Bank. Mapel quoted an article by Theodore Levitt, entitled "Marketing Myopia" in the July-August 1960 issue of *The Harvard Business Review*.

"The railroads did not stop growing because the needs for passenger and freight transportation declined. That grew.

"The railroads are in trouble today, not because the need was filled by others, (cars, trucks, airplanes, even telephones), but because it was not filled by the railroads themselves.

"They let others take customers away from them because they assumed themselves to be in the railroad business rather than in the *transportation business*.

"*The railroads could have had the world's best marketing organization. It would have made little difference to their passenger business. As long as they were mentally, physically, procedurally and organizationally committed to the transportation of people by rail, their decline was inevitable.*"

"Of course, I recognize I am not talking to railroad men," Mapel continued. "I am talking to farm chemical people who accept the fact that a farmer does not want to buy their chemicals. I realize that you know a farmer wants to buy the increased yield your chemicals can give him. Yet, the point that concepts are critical is so basic it merits repeated emphasis."

The next question is: how many of your *dealers* will be around to help and advise the big commercial farmers of 1970?

The current census tells us that less than 15 per cent of America's farmers produce more than 70 per cent of our total production . . . or about 600,000 farmers. To service these efficient businessmen, farm chemicals manufacturers and their dealers must become bigger and more efficient.

It has been pointed out by agricultural experts that dealers are not prepared for this job—because of the efficient management and enormous financing that today's modern agriculture demands.

The farm chemicals industry must help its dealers or they're *dead*. The game is getting rougher every year—and the stakes are going up . . . up . . . up!

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